

HISTORY OF
INDUSTRIAL PATERSON.






William C. Todd Fund

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Passaic Falls

FAIRBANKS

17-296

A HISTORY
OF
INDUSTRIAL PATERSON;

BEING A COMPENDIUM OF THE
ESTABLISHMENT, GROWTH AND PRESENT STATUS IN
PATERSON, N. J.,

OF THE
SILK, COTTON, FLAX, LOCOMOTIVE,
IRON AND MISCELLANEOUS INDUSTRIES;

TOGETHER WITH
OUTLINES OF STATE, COUNTY AND LOCAL HISTORY, CORPORATE RECORDS, BIOGRAPHICAL
SKETCHES, INCIDENTS OF MANUFACTURE, INTERESTING FACTS
AND VALUABLE STATISTICS.

ILLUSTRATED WITH VIEWS AND PORTRAITS ON STEEL,

AND INCLUDING A
MAP OF THE CITY,
CAREFULLY REVISED AND CORRECTED TO DATE.

By L. R. TRUMBULL.

PATERSON, N. J.:
CARLETON M. HERRICK, BOOK AND JOB PRINTER.
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P R E F A C E .

PATERSON, incorporated as a city for more than thirty years, with a population of about 60,000 inhabitants, the very cradle of the silk industry in this country and famous for its locomotive, iron, flax, cotton and miscellaneous manufactures ; world-renowned for its silk and locomotive productions more especially, having earned for itself the proud title of "The Lyons of America" and at the World's Exposition in Paris wrested the prize of merit from the astonished European builders of that triumph of modern mechanics, the locomotive—Paterson, that is now justly ranked among the first manufacturing cities in the country, has up to the present time had no written history. The merest fragmentary records, articles in local and other newspapers and magazines, meagre sketches in State histories, together with the recollections of the more aged citizens, a generation fast passing away—these are all that have existed to inform the Paterson of the Present and transmit to the Paterson of the Future a record of the struggles and achievements of the Past and the aggressive operations and important enterprises now being carried on. In these facts, mainly, are found the author's apology, if any is needed, for adding one more book to the vast collection already extant, for "of making books there is no end."

The object of this work, essentially a story of industrial progress, is to present in as compact and comprehensive a form as possible all that is most interesting and valuable in the way of local history, biography, incident and statistics and to preserve important records and facts from being lost beyond recovery. It is also sought to promote the general prosperity of Paterson and add to her dignity and importance by giving to the world a more complete understanding of her real status as a great industrial centre. In doing this care has been taken to avoid, so far as possible, dry and tedious details, which render many works of history utterly uninteresting to the general reader, and much incident and numerous sketches of "men, matters and things" have been admitted that may possibly be regarded by some as beneath what is termed "the dignity of history." An author cannot always be the most competent judge of what may prove valuable or interesting, but it is undoubtedly true that much important information has been lost to the world by a too fastidious view in this regard, while of that preserved much at the time considered comparatively insignificant has proved the most useful and instructive.

While this first history of Paterson, now offered to the public, makes but slight pretension to originality of thought or literary merit, it is claimed for it that its preparation has involved patient and protracted research in fields not heretofore explored and that the facts herein presented are trustworthy and reliable. Owing to the vast and diversified system of industry in Paterson the field is a large one, and great care was needed to so arrange the matter herein contained that the different subjects might be properly classified and inconsecutiveness, as to time, place and circumstance, be avoided as far as possible.

The author desires to acknowledge his deep obligations to Messrs. John Ryle, the brothers Cooke, John J. Brown, W. H. K. Bibby (since deceased), City Comptroller William Swinburne, George Wurts Cornelius Post (also since deceased), William Ryle, Superintendent of the Passaic Water Works ; City Superintendent of Public Instruction Esmond V. DeGraft, City Treasurer Henry Ridgway, John Swinburne, Joseph W. Congdon, Andrew Vreeland, George G. Halstead, George L. Catlin, Dr. Charles Inglis and others, who have contributed largely, either orally or through carefully prepared papers found in the Paterson Board of Trade reports and elsewhere, or both, to the success of this enterprise. Frequent and copious references to and large quotations from the valuable though fragmentary writings of the late Governor Philemon Dickerson, William Wright, at one time editor of the *Paterson Press* ; William Nelson, Dr. Fisher, William C. Wyckoff and A. T. Lilly will be found throughout the work, and to all of these both public and author are under deep obligation. For whatever of merit or utility there is in this book the credit is largely due to the courteous and talented gentlemen named ; for its errors and shortcomings, if such there be, the writer alone must be held responsible, but he is assured that his readers will do him the justice to believe that he has sought, to the best of his ability, to honor Paterson industry, to set before them in as fitting manner as possible the achievements of Paterson enterprise and perseverance.

TO the memory of John Clark, the father of the iron industry ; Thomas Rogers, the pioneer locomotive-builder, and to John Ryle, foster-father of the silk industry in Paterson ; also to the bold and enterprising men who followed them as manufacturers and to the skillful and intelligent workingmen and working-women who have rendered possible the realization of the grandest industrial achievements, this record of "INDUSTRIAL PATERSON" is respectfully dedicated by the author.

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A HISTORY OF INDUSTRIAL PATERSON.

CHAPTER I.

INTRODUCTORY.

ALTHOUGH this modest work does not, strictly speaking, aspire to the dignity and importance of a general history of Paterson, yet it may be pardonable, and even proper, to present very briefly the conditions and circumstances under which this portion of the State was settled, and, more particularly, and at greater length, the conditions existing immediately prior to the introduction here of the cotton industry, the first in point of time, as it was for many years in importance also, to enter into what its citizens are at this period proud to call "Industrial Paterson," adopting as their most appropriate motto, *Spe et Labore*—with Hope and Labor.

In sketching the events of the early days, and in describing the local features of ante-Revolutionary date, the author does not assume to intrude upon the province of the geologist by going back to that far distant period and attempting to describe the work of the Divine Architect, who, by His infinite wisdom and power, out of chaos formed these mountains, rocks and streams, so beautiful in themselves and so wonderfully adapted to the necessities of these later years. Nor will he attempt to draw upon the imagination to depict those scenes, when, in days long past, the dusky savage roamed over the ground now pressed by the busy feet of thousands engaged in the varied activities of civilization, worshipping in the dark recesses of the contiguous mountains their Gitché Manitou and other deities,

unknown even by name, in delightful anticipation of enjoying their happy hunting grounds in the shadowy world to come. Neither will the reader be invited to go back to the first settlement of our country, when the Pilgrim Fathers landed in search of a home in this since favored land for the enjoyment of civil and religious liberty. All this would be quite beyond the scope and purpose of a work of this character, and it is deemed most fitting that, after a very brief sketch of the formation of the State, its early Governors, quaint old laws, customs, etc., the thread of outline local history be taken up at about the time when the first settlement was made in this most beautiful region, conceded to rank with the very choicest included in the vast expanse of what is now our country—the finest, and, to us, the dearest of any on the habitable globe. From this point various matters of general interest present themselves, and events of no common importance, including those of the Revolutionary epoch, transpired within the limits of what is now the County of Passaic, demanding at least a passing notice, until that period is reached when, after liberty was achieved and the country lay exhausted and almost without resources, as the result of its seven years' struggle for freedom, the minds of our forefathers first conceived the idea of establishing domestic manufactures in this State, and of selecting this particular locality for that purpose, thus laying the very foundation of our subject proper, "Industrial Paterson." Beyond this, aided by the fragmentary records still existing, supplemented by the memories of the few remaining of generations now passed away, the endeavor will be to chronicle as fully and faithfully as possible the reverses and triumphs of organized industry in Paterson during a struggle continued through nine decades, including two important wars.

The history of this particular locality prior to the founding of the Society for Establishing Useful Manufactures, the date of which important event was very nearly identical with the birth of the town of Paterson, has in it little of very remarkable interest. In this respect it is unlike that of many other towns, in other parts of the country, where events of great importance had taken place in the earlier years. There is every reason to believe that this section, apart from the contiguity of the Great Falls, which have been visited and admired by the first people of the country almost since time immemorial, was rather uninteresting than otherwise, and its inhabitants old-fashioned, slow-going and pastoral, to whom, pursuing the even tenor of their way, the mild excitement of a periodical visit to "York" was an almost inexcusable dissipation.

In writing of a period antecedent to the incorporation of the Society for Establishing Useful Manufactures, before Paterson *was* Paterson, many difficulties are encountered at every step, and the progress is slow and uncertain. As intimated, the difficulty arises from the fact that there is very little in the way of documentary record extant, and all who were resident in this section in those days have long since departed from the scenes of active life. Under these circumstances the author has been compelled to glean the very meagre and incomplete accounts incorporated in the State histories for facts pertaining to the earlier epochs, and to fall back for some glimpses of the less remote past upon the memories of those aged citizens who were as nearly as possible contemporary. It is even difficult to gather the needed data in relation to industrial operations and general matters of

interest that occurred after the founding of Paterson, and very much more so to obtain anything reliable as to the condition of things anterior to that date.

Paterson is preeminently an industrial city, and the preparation of this work has been undertaken through a conviction that there has been, and still is, a great lack of reliable information with the general public as to the vast extent and immense importance of the operations being carried on about them. Occasional newspaper articles of great value have been published on this subject; also reports of the Paterson Board of Trade, of the Silk Association of America and other organizations, and by aid of these there have indeed been glimpses caught now and then of Industrial Paterson; but the articles have been far too fragmentary and the reports too limited in their circulation to accomplish the end desired. Thus the result has been very incomplete, even the leading industries not having been described fully nor the earlier or later operations consecutively and in detail, in such a manner that the facts which every Patersonian should know, and be proud to know, could be readily received and retained, either in the memory or in print.

Not that much excellent work has not been done in this direction by indefatigable members of the Board of Trade, by newspaper and magazine writers and others; but that the field has not been fully occupied is proven very conclusively by the fact that there exists nothing in the way of a local publication to which one may turn for full and reliable data as to the condition of the silk, locomotive, or other leading industry at any given time in the past. If information of this character is sought it is found only by laborious search among former publications of the Silk Association, which date back no farther than 1873; the report of Mr. Cowdin on "Silk and the Silk Manufacture," 1867; Mr. Brockett's "Silk Industry in America," 1876; Wyckoff's "Silk Goods of America," 1879, or other "foreign" publications, and the various reports of the Paterson Board of Trade, which date back only to May, 1874. In all except the latter, Paterson, which takes front rank in the manufacture of silk at least, is not usually represented statistically by itself, individually, but in connection with the entire State, and what mention is made of its industries is only casual. The result is an incompleteness that baffles at every turn when search is made for definite information. Another great evil is that the statistics and sketches of history published—of the rise and growth of the silk manufacture, for instance—are not only most unsatisfactorily incomplete and meagre, but there is a savor of "estimation" about the figures that detracts greatly from their value. That is to say, there is no evidence whatever that a thorough canvass has been made, each mill or shop visited and the actual results set forth.

There is no work extant that will show, even approximately, the number of operatives employed, the weekly or annual pay-roll, number of looms, spindles, etc., of the silk mills of Paterson at any time since John Ryle, that Patriarch of the industry, first started his scanty machinery in the old Gun Mill, about 1840, frightening the birds from their boughs and the snakes from their rocky dens across the river on Morris Mountain. To obtain data concerning the early years of the industry it has been necessary to patiently search the few books bearing on the manufacture generally, and in which the name of Paterson occurs here and there, and to sit beside the early pioneers of the industry and gather from them the recollections of their struggles and their triumphs.

In 1878 a very valuable work was published by William C. Wyckoff, Esq., Secretary of the Silk Association of America, entitled "The Silk Goods of America," in which appeared a more complete directory of silk manufacturers in the United States than had yet appeared. Paterson was especially well represented, the names of forty-eight silk firms being given, and seven silk dyers, or fifty-five in all. The exhaustive canvass made for this work showed the existence of ninety-three different firms or corporations engaged in the silk manufacture in Paterson. While it is true that a number have commenced operations since the publication of the work alluded to, it is also true that there must have been many more in existence at that time. It was not wonderful that a number were overlooked, even though a conscientious canvass was made, for not a few of the new men engaged in the business are found to occupy lofts pretty well to skyward, perhaps in some otherwise untenanted and almost forgotten old mill, or in some far-away rear building, or in a portion of the city not heretofore invaded by the "silk men." Some of these were pioneers of the industry nearly or quite forty years ago, who, having had reverses and perhaps having been out of the business and lost sight of for years, are now feeling their way carefully again and are very sensitive over the past and the present and shrink from publicity in reference to their status.

Paterson seems to have been especially designed by nature to become just what it is fast becoming, one of the first among the industrial centres in the Western world; it is scarcely too much to say that it has achieved that proud position already. There are few among the more public-spirited of the older residents who have not at some time or another taken a stranger friend to one of the high eminences which surround the busy city and pointed with gratification to the locomotive shops, the vast iron works, the numberless silk, flax, paper and other mills and taken pride in calling attention to the numerous industries which have made Paterson what it is and which assure for it a brilliant future. Here are all the natural and many of the acquired advantages that can be desired for the location of an industrial centre; a useful and beautiful river, affording an ample supply of the purest water, close proximity and ample communication with the market of the Country and an atmosphere conducive to health, beside many others which may readily be added to these, which are of cardinal importance. It is no wonder that numbers of the old-world operatives come flocking to Paterson by every steamer that crosses the Atlantic to find ready employment and soon establish themselves in comfortable homes, until the Paterson working people are the envy of all others on both continents; and it is no marvel that the mills and shops of Paterson are multiplying at a ratio almost incredible, for here is every element to promote a rapid growth and a prosperity established on a solid basis of the eternal fitness of things. Paterson has evidently been predestined to become great and powerful by the laws of natural selection, and great and powerful she will doubtless become.

It is confidently predicted that the silk and other industries are only in their infancy here as yet, and that some day in the not distant future another generation will look back on the present as the "day of small things" and wonder at the supreme complacency with which people regarded the status as it now exists. In view of the great mills looming up on every side, shedding light upon the early morning

and evening from their countless windows and filling the air with the whirr of machinery, and the vast processions of operatives thronging the streets in passing to and from their work morning, noon and night, it may seem almost incredible that the coming citizen should ever so regard it, but among the more thoughtful of those who have kept the onward progress of events in this department in view there are not a few who are sanguine enough to predict that Paterson is destined soon to beggar the chief centres of silk manufacture in Europe, attracting to itself all the best skilled labor and transferring the industry largely to the banks of the Passaic, even as it has already done in a measure unexpected but a few years since. The locomotive and other interests also are fast recovering—have almost fully recovered—from the stunning effects of the panic, and the time seems most opportune to look over the field and see where we are and what lies before us.

To the preparation of this work much time has been devoted. It is the result of patient and painstaking research, all sources of information, written and unwritten, having been laid under contribution, the object being to render it as full, thorough and accurate as possible.



CHAPTER II.

OUTLINE OF GENERAL HISTORY.

IN the 23rd day of June, 1664, the Duke of York, brother to Charles II., then the reigning King of England, conveyed to Lord Berkeley and Sir George Carteret the territory which is now the State of New Jersey. The instrument by which the conveyance was effected recited that the tract of land was sold for the sum of "ten shillings of lawful money of England," and, in addition thereto, that a rent of "one peppercorn" be paid on the day of the nativity of St. John the Baptist, if legally demanded. This appears to have been the first instrument in which the bounds of New Jersey were regularly defined. It was stipulated therein that the said tract of land be called by the name of "*Nova Cesarea*, or New Jersey," which name, it was understood, was given in compliment to Sir George Carteret, who had defended the Island of Jersey against the Long Parliament in the civil wars. The Constitution then formed, securing equal privileges and liberty of conscience for all, was the first Constitution of the Province and remained in force until 1676, when the Province was divided, Lord Berkeley selling his share, afterward known as West Jersey, to two Quakers. Sir George Carteret, sole proprietor of East Jersey, died in 1679, leaving a will which directed that the Province be sold to pay his debts. This was done, by his widow and executors, and the Province became the property of twelve purchasers, called the "twelve proprietors." Each of these took a partner in March, 1682, and the number was thus increased to "twenty-four proprietors." Philip Carteret, appointed Governor by the two first "proprietors," continued in office until 1681, his salary being generally about £50 a year, paid in country produce at prices fixed by law. Robert Barclay, a noted Scotchman, succeeded Carteret as Governor for life of East Jersey, with dispensation from personal residence. His first deputy was Thomas Rudyard, who was soon superseded by Gawan Lawrie, who was succeeded by Lord Niel Campbell, who in turn was succeeded by Alexander Hamilton, who continued in office until April, 1702, when, the "proprietors" falling out, the Province was tendered to and accepted by Queen Anne. East and West Jersey were then reunited and the government, together with that of New York, was entrusted by the Queen to her kinsman, Lord Cornbury, who continued in office until 1708. The people complained so bitterly of him that the Queen was then compelled to revoke his commission, upon which his creditors put him in prison in the Province he had

formerly governed, until he became a peer, by succession, and could be held no longer. The Province at this time contained about 25,000 inhabitants. It was misgoverned by various appointees of the Crown until the last of the royal Governors, William Franklin, son of Dr. Benjamin Franklin, came to the office in 1763.

At the commencement of the Revolutionary struggle New Jersey was foremost among her sister colonies in resisting the aggressions of British tyranny. The action of the people who organized for the protection of their rights was opposed by the Governor, who, however, was powerless to stay the tide which set in toward freedom, and on December 6th, 1775, he prorogued the Legislature until January, 1776, and it never reassembled; that was the termination of the Provincial Legislature of New Jersey. On the 25th of June, 1776, the deposed Governor, who had made himself very obnoxious by showing himself an enemy to the liberties of his country, was sent under guard to Governor Trumbull, of Connecticut, who released him on parole, and he sailed to England and was granted a pension.

The first Legislature of independent New Jersey convened at Princeton, August 27th, 1776, and on the 31st of the same month William Livingston was elected Governor, and continued in office for fourteen years, during several of which the State was the theatre of war. There is hardly a town in the State which lay in the route of the British army that was not signalized by some enterprise or exploit during the Revolution. The losses of New Jersey, both in men and property, in the Revolutionary struggle exceeded that of any other of the thirteen States, in proportion to her population and wealth. By her sacrifices of blood and treasure in resisting oppression she is entitled to stand in the foremost rank among those who struggled for American freedom. At Trenton the enemy received a check which turned the tide of the war. In the Summer of 1778 Sir Henry Clinton retreated from Philadelphia through New Jersey to New York, the battle of Monmouth signalizing his flight.

Governor Livingston died in 1790 and was succeeded by William Paterson, after whom the city of Paterson was named at its founding, in 1792. Governor Paterson resigned in 1792 and was succeeded by Richard Howell, after whom followed Joseph Bloomfield, John Lambert, Aaron Ogden, William S. Pennington, Mahlon Dickerson, Isaac W. Williamson, Peter D. Vroom, Samuel L. Southard, Elias P. Seeley, Philemon Dickerson, William Pennington and Daniel Haines, the last-named being elected in 1843.

Among the miscellaneous items of history, which serve to throw light upon the condition of the times to which they refer, mention may be made of certain early "moral laws," the provisions of which were somewhat curious. "Concerning the beastly vice, drunkenness," the first laws inflicted penalties of one shilling, two shillings and two shillings and sixpence for the first three several offences, and, in default of payment, corporal punishment. In 1682 the fine was raised to five shillings, or confinement in the stocks for six hours. In 1668 each town was compelled to keep an "ordinary," for the entertainment of strangers, under a penalty of forty shillings for each month's neglect. In 1692 laws were passed requiring an observance of "the Lord's Day" by abstaining from all servile work, unlawful recreations, unnecessary traveling, etc., and keepers of public houses were not to allow "tip-

pling on the Lord's Day, *except for necessary refreshment*." As early as 1668 swearing was made punishable by a fine of one shilling for each offence; in 1682 the fine was increased to two shillings and sixpence. "All prizes, stage-plays, games, masques, revels, bull-baitings and cock-fightings, which excite the people to rudeness, cruelty and looseness," were strictly prohibited. Night-walkers and revelers found abroad after nine o'clock were imprisoned until morning. "*Any expression of disrespectful language referring to those in office*" was punishable by fine, the stocks, the whipping post, or, as from 1675 to 1682, by *banishment*. In 1676 all liars were included; for a second offence incurring a penalty of twenty shillings.

Among the numerous instructions given to Governor Cornbury was one directing him to "permit liberty of conscience to all persons, except Papists"; and another reciting that, "forasmuch as great inconveniences may arise by the *liberty of printing* in our said Province, you are to provide by all necessary orders that no person keep any press for printing, nor that any book, pamphlet or other matters whatsoever be printed," etc.

Prior to 1676 the only road through New Jersey was that by which the Dutch at New Amsterdam reached the settlements on the Delaware, which was little more than a foot path. Even as late as 1716 neither this road nor the ferry at New Brunswick afforded facilities for other than horsemen and pedestrians. One Delaman was permitted by Governor Hamilton, in 1737, to drive a wagon on a new road which passed from New York to Philadelphia through Perthtown, now Perth Amboy, but no regular time nor price was set for the trips. Exclusive rights of transportation over this road, granted by Lord Cornbury to a person who made fortnightly trips, were one of the abuses of his lordship's administration. Afterward a line was established by way of New Brunswick, and in 1734 another, via Bordentown, running from South river, the proprietor of which line was pledged to be at New York "once a week, if wind and weather permit" In later years roads and stage lines multiplied, and in 1750 a new line advertised to make the journey between the two chief cities of New York and Philadelphia "in forty-eight hours less time than the old stage-waggon." The time required for the trip was from five to seven days. In 1704 "in the pleasant month of May" a New York newspaper announced: "The last storm put our Pennsylvania post a week behind, and it is not yet com'd in." In 1791, just before the date of the founding of Paterson, there were but six Post-offices in the State; at Newark, Elizabeth, Bridgeton, Brunswick, Princeton and Trenton. The total receipts of the six aggregated \$530 for the year, of which the Postmasters received \$108.20, leaving \$421.80 as the revenue to the Government.

CHAPTER III.

OUTLINE OF LOCAL HISTORY.

PASSAIC County was formed from the Northern part of Essex and the Western part of Bergen Counties, February 7th, 1837. Its extreme length is thirty miles; its breadth varies from two to sixteen miles. It is bounded on the North by Bergen County and a part of Orange County, N. Y., East by Bergen and Hudson Counties, South by Essex and Morris Counties and West by Sussex County. The surface is generally hilly, with broad and fertile valleys, excepting in the extreme Southeastern part, where it is mainly level. The county is well watered by the Passaic, Pequannock, Ridgewood, Pompton and Ramapo rivers. The facilities of transportation consist of three important railways and their connections: the New York, Lake Erie and Western, the Delaware, Lackawanna and Western (Boonton Branch), and the New York, Susquehanna and Western (late the New Jersey Midland). Besides these there is the Morris Canal, which passes through the Southern portion of the county. Each of the three railway lines furnishes frequent communication with New York City, and, through their respective connections, with the far West. In the Northern part of the county are vast deposits of iron ore, which is worked up in the extensive furnaces and forges contiguous thereto. The county is not especially noted for its agricultural products, but derives its chief importance from its extensive manufactures. The population of the county in 1840, three years after it was formed, was 16,721. At this time it was divided into five townships, as follows: Acquackanonk, Pompton, West Milford, Paterson, Manchester; two others, Little Falls and Wayne, have since been formed.

Barber and Howe's "Historical Collections," published in 1844, describes Acquackanonk as having at that period eight stores, one cotton factory, two tanneries, one grist mill, one sawmill, one academy, three schools, 130 scholars and \$73,600 capital invested in manufactures; population, 2,483. Acquackanonk, being at the head of navigation on the Passaic, fifteen miles from its mouth, early acquired much importance and was long known as the "Landing." In the "Historical Collections" appears an Eastern view of the village of Acquackanonk, which shows the denser portion of the hamlet, together with the Reformed Dutch Church and Academy, and another church is described, in the Western part of the place, as being

built of brick and ornamented with a cupola, on the front of which was a tablet bearing the inscription :

" HITHERTO THE LORD HAS HELPED US —1 Sam. VII. 12.

THE TRUE REFORMED DUTCH CHURCH,
OF ACHQUAKANONK.

Erected A. D., 1825."

This was the old Seceder Church, still standing, of which the venerable "Dominie" Berdan has been pastor for more than fifty years.

An officer of the Revolutionary Army who passed through Acquackanonk and Paramus in 1778 thus gives his impressions :

"These towns are chiefly inhabited by Dutch people; their churches and dwelling-houses are built of rough stone, one story high. There is a peculiar neatness in the appearance of their dwellings, having an airy piazza, supported by pillars in front, and their kitchens at the ends in the form of wings. The land is remarkably level and the soil fertile; and, being generally advantageously cultivated, the people appear to enjoy ease and happy competency. The furniture in their houses is of the most ordinary kind, and such as might be supposed to accord with the fashion of the days of Queen Anne. They despise the superfluities of life and are ambitious to appear always neat and cleanly and never to complain of an empty purse."

Little Falls village is described in the "Historical Collections" as follows : "There are at this date (1844), four stores, several manufacturing establishments and mills, one Reformed and one Methodist church and about 60 dwellings. There is here an excellent quarry of red sandstone, which was used in the construction of Trinity Church, New York. From it has been carved some beautiful statuary by Mr. Thom, the sculptor, formerly a resident of the village."

Of Manchester, formerly a part of Saddle River, Bergen County, the same works says : "The village of Manchester, formerly called Totowa, is situated on the Passaic in a romantic and picturesque region of country immediately opposite Paterson, with which it is connected by two bridges, and in a general description it should be included as part of that town. It contains several manufacturing establishments, a Reformed Dutch church, a church for colored persons and about 1,600 inhabitants. Goffle (called by the old Dutch residents *de Gaffel*, or the place where the roads *fork*), is a hamlet in the Northeastern part of the township." Accompanying is a view of the village of Manchester taken from the summit, at the quarry, to the South of the thickly settled portion.

The population of Pompton at this date is given as 1,437, and a further description says that there were in the township eight forges, one furnace, three grist mills, six saw mills, five schools and 186 scholars. The name was derived from the Pompton tribe of Indians. Ryerson's, on the Pequannock river, and Ringwood, Boardville and "Whinokie," on the Ringwood river, are mentioned as unimportant places.

In 1844, ten years after its formation, from Pompton, West Milford had ten forges, two tanneries, two grist mills, five saw mills, eleven schools, 408 scholars and a population of 2,108. "Mackepin," Hanks, Cedar, Buck and Dunker Ponds

with outlets into the Pequannock river, are spoken of; also Long Pond, now Greenwood Lake, which is described as a favorite resort for anglers.

At this period the township of Paterson, which had been formed from Acquackanonk in 1831, was represented as having a population of 7,598. The village of Paterson, the seat of justice for Passaic County, lay then, as now, on both sides of the river and included an area of thirty-six square miles. It was governed by a Mayor, Recorder and Common Council. It was regarded as the second town of importance in the State. A more detailed description of Paterson will be found in its proper connection, largely incorporated with the city's industrial history proper. This course seems especially fitting in view of the fact that its growth and advancement, as village, town and city, were always commensurate with and largely controlled by its progress in manufactures. It is the same even to the present day. It was to manufacturing enterprise that Paterson owed its birth, and it always has been, and probably will remain, *par excellence*, "Industrial Paterson."

There were no battles fought within the bounds of what is now Passaic County during the Revolution; still this section was included within the theatre of military operation, and both armies were found now and again in the immediate vicinity of Paterson. In 1776 and 1778 there were slight skirmishes at Acquackanonk, but nothing occurred of serious consequence. During the Autumn of 1780 the American army was encamped at Totowa; the left wing, under Lafayette, being at the Goffle, and Wagaraw; the centre back of Totowa, along the foot of the Preakness range; while the right, under Lord Stirling, held a position to defend the approach to the Great Notch. General Washington's headquarters were in a fine brick structure once known as the Dey, but later as the Hogencamp, mansion, though he was a frequent visitor of and at times lodged with the Van Houtens, of Totowa.

In 1781, while a part of the Jersey Brigade was encamped in Wanaque Valley, the mutiny occurred which has been incorporated into the history of that period. The troops considered themselves ill-used, and probably they were; but discipline must be maintained. Washington sent a strong detachment of reliable troops, made the mutineers prisoners and, after a brief court-martial, had two of them shot on the spot. Of this occurrence the following account is given by Surgeon Thacher, who accompanied the detachment:

"Marched on the 27th at one o'clock A. M., eight miles, which brought us in view of the huts of the insurgent soldiers by dawn of day. Here we halted for an hour, to make the necessary preparations. Some of our officers suffered much anxiety lest the soldiers would not prove faithful on this trying occasion. Orders were given to load their arms. It was obeyed with alacrity, and indications were given that they were to be relied on. Being paraded in a line, General Howe harangued them, representing the heinousness of the crime of mutiny, and the absolute necessity of military subordination, adding that the mutineers must be brought to an unconditional submission; no temporizing, no listening to terms of compromise, while in a state of resistance. Two field-pieces were ordered to be placed in view of the insurgents, and the troops were directed to surround the huts on all sides. General Howe next ordered his aid-de-camp to command the mutineers to appear on parade in front of their huts, unarmed, within five minutes; observing them to hesitate, a second messenger was sent, and they instantly obeyed

the command, and paraded in a line without arms, being in number between two and three hundred. Finding themselves closely encircled and unable to resist, they quietly submitted to the fate which awaited them. General Howe ordered that three of the ringleaders should be selected as victims for condign punishment. These unfortunate culprits were tried on the spot, Colonel Sproat being president of the court-martial, standing on the snow, and they were condemned to be shot by twelve of their comrades, partners in their crime. Two were thus executed; the third was pardoned. The mutineers were buried where they fell, a mile or two Northeast of Pompton, in a secluded, neglected spot among the hills, where a few stones, rudely heaped together, are the only monuments of the two misguided men, who were about as much sinned against as sinning."

While Washington was encamped at the foot of the Preakness hills the whole army was kept in a constant state of readiness for active operations, the advance corps being placed under command of Lafayette, the right wing (Pennsylvania and Connecticut Brigades) under command of Lord Stirling, and the left wing (the four Massachusetts Brigades) under Maj. Gen. St. Clair. A flying hospital was established at Demund's, on the old Pompton road. It is said that the bold hill on the east side of the Notch was a favorite lookout of Gen. Washington's at this time, and that from this point he once detected a raiding party of British sallying out from Elizabethtown, and promptly despatching a troop of cavalry behind the hills to Springfield intercepted the foragers as they were making off with a fine lot of cattle and other booty.

There was a great deal of straggling from camp, and Washington rebuked this in a general order, in which he stated that in a ride he took "the other day" he found the soldiers as low as Acquackanonk bridge, on both sides of the river, and as far as he had ever yet gone, around the environs of the camp, the roads and farm-houses were full of them.

An incident is handed down by tradition that probably grew out of this habit of straggling. On one occasion a party of American soldiers were chased by a daring company of redcoats, even to the Passaic river, near the present Main street bridge. The Americans got across safely, and partly cut down the old bridge. The impetuous British, bent on pursuit, dashed into the water, the officers mounted on the privates' shoulders, but ere they had got half way across a hot fire from the American camp caused them to turn back with even greater speed than they had shown in the pursuit.

Robert Erskine, agent for the London Company, at Ringwood, took sides from the first with the Colonies, and so early as August, 1775, he fully equipped a company of Continental militia at the Ringwood Works, at his own expense—one of the very first companies organized in this State for the war. The Provincial Congress warmly commended his zeal and ordered that he be commissioned Captain of the company. He did valuable service to the American cause in running the works during subsequent years, supplying cannon balls and other necessities to the army. Moreover, his knowledge of the topography of the country was great, and Washington made him Geographer and Surveyor-General to the Army, which position he doubtless held until his death, in 1780. He is buried at Ringwood, not far from the ruins of the old Ringwood Furnace, and near the road running from Ringwood to Long Pond. He was 45 years of age when he died.

It was long a matter of tradition that one of the Ryersons, who owned a furnace

and forge at Pompton, made cannon balls and secretly delivered them on board of British war vessels at New York, but this is said to have been a slander. The story really originated at the time of the war of 1812, and did not relate to transactions during the Revolution, and about nine years afterward, in 1821, Mr. Ryerson compelled two well known citizens who had circulated the story to deny its truth over their own signatures.

It is recorded that the most prominently active British sympathizer in this part of the State, if not in New Jersey, was Robert Drummond, a wealthy ship owner and merchant at Acquackanonk Landing, who had married Jannetje Vreeland. He was a member of the Provincial Congress in May, June and August, 1775, and acquitted himself so satisfactorily to his constituents that they re-elected him in September, but when active hostilities began he placed his services at the disposal of his King, and organized the Second Battalion of New Jersey Volunteers, of which he was commissioned Major. It was stated that upwards of 200 members of this battalion were his neighbors, who had been persuaded to enlist under his influence. This, however, is said to have been false, and that he must have gotten his recruits from the Bergen County side of the river. Most of his battalion fell victims to the climate in the Southern States, or perished in battle. Maj. Drummond himself went to England after the war, with his wife, and died at Chelsea, in 1789.

On August 21st, 1781, an army passed through Acquackanonk for the last time. It was the American force hurrying toward Virginia to attack Lord Cornwallis, whose surrender followed two months later.

In this connection it is most appropriate that the following brief account of Lafayette's subsequent visit to the scenes of his former exploits, and of his reception by a grateful people, be given, in conclusion of these Revolutionary reminiscences; it is from the pen of the late Peter Archdeacon, who was an eye-witness:

"General Lafayette returned to the United States and landed in New York on the 10th of August, 1824. He soon afterwards visited Paterson. Never did the lovely banks of the Passaic appear in such majestic grandeur.

"The pleasant foliage, bending to the fragrant breeze, saluted the welcome visitor at every step, as if nature herself would hold her grand levee. Flora decked the knolls and in the little fissures of the rock a bouquet there she dropped. Neptune, jealous of sweet Flora's balmy gift, his trident seized and sent a shower of pearly drops which sprinkled the variegated iris that encircles the chasm of the Passaic.

"After a lapse of forty years the recollections of Totowa were fresh in the visitor's memory. Lafayette on his arrival in Paterson was received with all the congratulations that could arise from the hearts of freemen; the flow of gratitude for his able and generous efforts in the cause of liberty added to the delight so rapturously felt at once more beholding the companion of the beloved Father of his Country, who shared his toils and dangers. The procession entered Paterson from the Bergen (now Manchester or North Ward), side of the river, under two superb arches displaying their festoons and a variety of flowers interwoven with evergreens. One was inscribed—'Behold our second Father cometh!' On the other—'Welcome, Lafayette!'

"The houses were everywhere tastefully decorated with wreaths and festoons, the streets were swept, the fire companies displayed their patriotic feeling on the occasion, by sprinkling the route with engines, which added much to the pleasure of the scene. The procession moved through the principal streets, which were

strewn with flowers. The throng was immense ; it was difficult to move, and many of the house-tops were crowded with anxious eyes to catch a glimpse of the nation's guest. The ladies from the windows greeted the hero with their bewitching smiles, and waved their white handkerchiefs to the breeze, as a token of welcome to the illustrious Lafayette. The procession arrived at the large hotel that formerly stood upon a part of the ground now occupied by Congress Hall, in Main Street, which was then kept by Mr. James McNally. Here the assembled citizens rent the air with their acclamation of "Welcome, Lafayette!" The General answered with smiles and the waving of his hand. A splendid collation was prepared of the choicest productions of the season. The nation's guest was introduced to the citizens by the old patriots, Gen. Godwin and John Travers, Esq. After many salutations and hearty welcomes to his adopted country the General rose and gave the following toast:

'The recollections of Totowa and the enjoyments of Paterson ; may this happy, populous, manufacturing town, more and more bear witness to the superiority of Republican institutions and the blessings of freedom, equal rights and self-government.'

"The General afterward departed amidst the hosannas of the multitude, accompanied by his old friend, Gen. Godwin."

Judge Henry P. Simmons, of Passaic City, who was a very small boy at that time, remembers the scene at this reception, and says that Lafayette was taken to a large four-story hotel on Market Street, which occupied the site of what has since been known as the Merchants' Loan and Trust Company's building. The then embryo Judge opened wide his eyes to see the carpets spread for the honored guest to walk on after stepping from the carriage, for in those days the houses of even the wealthiest families were guiltless of any covering, save, perhaps, clean white sand.



CHAPTER IV.

EARLY SETTLERS.

IN 1666 a colony of New England people, the first white settlers in this portion of the State, purchased a tract where Newark now is, their territory extending Northerly along the Passaic to the Third or "Yantacaw" river. The land on the other side of the Passaic was bought by John Berry in 1669. But the whole of New Jersey North of Newark and West of the Hackensack was at this time a wilderness, familiar only to the red man and penetrated by but few of the most daring of the whites. The latter came back with wonderful tales of the richness of the land, and of the marvelous "Totowa Falls," which, to the Dutch, who were more familiar with canals than with water-falls, doubtless was an extraordinary spectacle. Indeed, it was then the most striking natural curiosity known to the whites in America, for the Falls of Niagara had been seen only by a few adventurous Jesuits.

After the settlement of Newark the advancement was rapid, and three years later nearly all the land on the East side of the Passaic as far as Saddle River was purchased. The first real estate transaction within the present Passaic County occurred in 1678, when Dundee Island, then known as Menehenicke, was sold by Captahem Peeters, an Indian Sachem, to Hartman Michielson (Vreeland), from the town of Bergen, who procured a patent therefor in 1685 from the East Jersey proprietors, upon agreeing to pay as a yearly rental "one fatt henn," forever, if demanded. The same year Christopher Hoogland, of New York city, purchased 278 acres where the present city of Passaic now stands, but he soon sold out to Michielson. Others came from Bergen and much more land was purchased along the river up to the Great Falls. This purchase was completed in March, 1679, when the Indians were paid for their territory in coats, blankets, kettles, powder, trinkets and gewgaws, the purchasers receiving a deed from Captahem. The following record of this transaction is found among old documents still existing :

"March 28, 1679, Captahem, 'Indian Sachem and Chief, in the Pr'sence and by the approbation and consent of Memiseraen, Mindawas, Ghonnajea, Indians and Sachems of the said Country, for and In Consideration of a certain P'rsall of Coates, Blankets, kettles, powder, and other Goods,' conveyed the tract 'known by the name of Haquequenunk' unto Hans Dederick, Gerret Garretson, Walling Jacobs and Hendrick George."

Later a patent was received for this also, from the East Jersey proprietors. The deed purported to cover a transfer of about 5,500 acres, but the tract actually contained over 10,000 acres, being bounded as follows: From the Third River to the Falls; thence to Garret Rock and along the face of the cliff Southwesterly to the county line; thence to Third River. The tract was called "Haquequenunk," "corrupted" after passing through many intermediate stages, to Acquackanonk, as at present. At different times this name was called Hockquackonong, Acquegenonch, Agueyquinunke, Aquikenong, Achquackununk, Ackquequenong, besides many other quite similar.

The original patentees were fourteen in number: Hans Diedericks, Gerret Gerretson, Walling Jacobs, Elias Michielson, Hartman Michielson, Johannes Michielson, Cornelius Michielson, Adrian Post, Urian Tomason, Cornelius Roelofson, Symon Jacobs, John Hendrick Speare, Cornelius Lubbers, Abraham Bookey. Gerretson came from Wageningen, Holland, and soon the younger generation came to be known as "Van" (from) Wageningen, after which it was easy to arrive at Van Wagoner, a well known name in the vicinity at the present day. The Jacobses were from Bergen, and their descendants are the numerous Van Winkle family. The Michielsons were descended from Michiel Jansen, who came from New York and settled at Communipaw. His descendants are the Vreelands, also a numerous family. Adrian Post was a son of Captain Adrian Post, who came to this country in charge of a colony and settled at Bergen Point. The numerous Van Rippers in this section are the descendants of Urian Tomason. The Van Houtens were in part at least descendants from Cornelius Roelofson—son of Ralph; and the descendants of John H. Speare are still living in various parts of Passaic and Bergen Counties. Cornelius Lubbers is responsible for the Van Blarcom and Westervelt families, of which he was the lineal progenitor. Abraham Bookey did not live on the new purchase long and left no descendants here, so far as known.

These first settlers probably took possession about 1683, in the Fall, their settlement being all along the river bank up as far as Main Bridge, Passaic City, fourteen farms of about equal size, one hundred acres each, being laid out. The balance of the tract was afterward apportioned, some of it not until about 1714, when the last division was made.

The first real glimpse of Acquackanonk is afforded by the narrative of two Labadist missionaries, who came to this country in 1679 to prospect for a favorable site whereon to found a colony of their co-religionists. While they were sojourning temporarily among the Dutch at Bergen in the Fall of 1679 they heard glowing accounts of the richness of "Ackquekenon," where "Jaques of Najack," with seven or eight associates, had purchased from the Indians, for about \$50, a tract of 12,000 *morgen*, or 24,000 acres. This was the Saddle River tract, bought by Jaques Cortelyou, of Long Island. It is described by various writers of the time as a great island, possessing special advantages for settlement. In March, 1680, these Labadists sailed with an Indian guide from Gowanus Bay to Acquackanonk, landing about where the Rusling bridge now is, at Dundee, the voyage occupying the better part of two days. They then journeyed on foot to the Great Falls, of which they gave a description—the first of which we have any account. William

Nelson, in his "Historical Sketch" of Passaic County, says, in reference to the division of the Indian purchase of March, 1680 :

"When these lots were partitioned off there was left an odd triangular plot, which it was concluded to consecrate to religious purposes and the interment of the dead, a church being organized in 1694, and a modest building erected within the next six or eight years for public worship. 'Dominie' Guiliam Bertholf, at the time a school-teacher in the village, was called in 1693, and was the first regularly-settled Reformed Dutch pastor in New Jersey, as also the first school-master in the county."

The second settlement in the county was made at Pompton by Major Anthony Brockholls and Captain Arent Schuyler, both from New York, the former having been acting Governor for a time and Mayor of the city, and both having been branded as traitors by the then Governor, Leisler, for resisting his usurpations of power under William and Mary, of England. A price being set on their heads they fled and settled at what is now Pompton village in 1697, and others soon followed.*

Preakness was settled first by Johannes De Reimers—afterward Doremus—about 1715. In 1706 George Ryerson of Pompton and his two brothers from New York purchased a part of what is now Manchester, and three years later George Francis and Zurya Westervelt purchased the balance from the Indians, embracing a portion of the First Ward of Paterson, as now divided.

Little Falls was first settled in the Stony Road neighborhood, now a suburb of Paterson, in 1711, by Francis Post, John Sip, Harmanus Garrison, Thomas Jervanse (Van Ripen), Christopher Stymnets, Cornelius Doremus, Peter Powlosse and Hessel Pieterse, all farmers from Acquackanonk. The site of the village of Little Falls was settled a dozen years later, and the same names, such as Brower, Francisco, Van Ness, Vreeland, as are most common there now, were known in that vicinity in that early day. During the first quarter of the 17th century the beautiful Wanaque, or Wynockie, valley was discovered to be a charming section, and later the rich wealth of iron ore was discovered and the Ringwood Iron Co. was formed, first by New York capitalists, who, however, soon sold out to "The London Company," who carried on the works until the Revolution. These mines, added to the other natural advantages of that section, resulted in the settlement of Pompton and West Milford at an early date.

The London Company's operations were very extensive for many years. Robert Erskine, the son of a Scotch clergyman, and in many respects a remarkable man, was agent about 1771 and later. Mr. Nelson says: "He inventoried the Company's personal property at £30,000, and said the annual circulation of cash and

* In 1695 Schuyler and Brockholls formed a company, associating with them Samuel Bayard, George Ryerson, John Mead, Samuel Berrie, David Mandeville and Hendrick Mandeville, and on June 6th of that year, they bought of the Indians 5,500 acres of land "at or near Pequanneck and Pomtan creek." The Indian grantors were Taepgan, Oragnap, Mansiem, Wickwam Rookham, Paakek, Siekuak, Waweigin, Onagepunk, and Niskilomitt, Peykqueneck and Pomtan Indians, and Iaiapogh, Sachem of Minising. The last-mentioned Chieftain's name was long preserved in Yawpaw, recently supplanted by the meaningless appellation Oakland, bestowed on the Midland station next below Pompton. The consideration for these 5,500 acres, "to be taken up by him the said Arent Schuyler to his best Liking at or near Peckquanneck and Pomtan and the Low Land Lying on both sides of the Creek between Peckquanneck and Pomtan aforesaid," was "a certaine quantitie of Wampom, and other goods and Merchandise to the value of £240, Current money of New York."—*Nelson*.

supplies was from £20,000 to £30,000, while he had under him 500 or 600 men—clerks, overseers, forgemen, founders, colliers, wood-cutters, carters and laborers. At that time American manufactures were prohibited by England, and the London Company could merely make its iron into pigs and blooms; these were transported over wretched roads to Acquackanonk Landing, there loaded on sloops and carried to New York, where they were shipped to England, to be made into various articles and brought back and sold in America for whatever prices the manufacturers chose to ask. This was a fair sample of the workings of the British free-trade policy one hundred years ago. Under a different system, the iron mined at Ringwood is made into locomotives, bridges and every sort of machinery, within twenty miles of the furnaces, affording employment to thousands of hands, and furnishing a demand for all the produce the farmers of the vicinity can raise. The mines are now within twenty miles of a market, whereas in the days of the London Company their market was three thousand miles away. It is no wonder that the investment was a financial failure, under such a state of things. It may be noted here that the oldest pig in the country is to be found at Charlotteburg. It is not a live porker, but a pig of iron, moulded there, and bears the legend, in raised letters—'Charlotteburg, 1770.' The ruins of a forge as old as the Revolution may still be discerned on an island in the Pequannock river, a mile or so above Smith's Mills, and a little further up, on a beautiful, sunny slope, shaded by a gigantic chestnut, are clustered the graves of some scores of those patient toilers, (German workers in the mines), who had left 'Fatherland' to find new homes and eternal rest in America."



CHAPTER V.

OLD PATERSON.

ACCORDING to the census of the late Rev. Dr. Fisher, to whom the author is greatly indebted for valuable data of this period, there were on the site of the present city of Paterson but ten dwellings and one church in the year 1791, immediately prior to the founding of the Society for Establishing Useful Manufactures, and from 1795 to 1801 there was neither clergyman, lawyer, justice of the peace or constable within three miles. The place was scarcely, if anything, more than a hamlet. Of these ten old structures three or four remained until 1856; to wit, a part of the Passaic Hotel—that portion left standing by the great flood of 1810, which swept a greater part of it away; the old Van Winkle house, not far distant; the old Van Houten house, on Broadway, North side, West of the Erie track, on the site of the present residence of John R. Van Houten, and a portion of the old Bensen house, a venerable stone structure erected about the year 1770 by David Bensen, on what is now Water street and directly across the river from the Passaic Hotel. His grandson, Cornelius, built a part of the house as it stands at present, a one-story addition on the Southwesterly end, and even this has now an antiquated appearance. Since 1856 two of the four have been demolished, leaving only the Passaic Hotel and the Northern end of the old Bensen house as relics of the plain, severe but enduring structures of a generation long passed away, and about whom there was very little nonsense.

The scant information that can be gleaned of the more minute details of this period is mainly through tradition and, consequently, not quite infallible. Still, the following account of the early settlers within the present limits of the city has been obtained from the very oldest citizens, as nearly as possible contemporary, and the most reliable data have been patiently sought: The historic Passaic Hotel was probably built about a quarter of a century before the Revolution, and when this section of country was included in the theatre of military operations, at least to an extent that drew the great leaders of the struggling patriots in this direction, the fine old farmstead, with its dependencies, was owned and occupied by Jacob Van Winkle, who had the honor of performing the part of host to Washington, Lafayette and other distinguished men, both officers and civilians. Later, when Lafayette revisited this country, as described in a preceding chapter, he remem-

bered the house where he had been entertained on former occasions, though he was then a young man and had since grown old, and sought it out. One fact in relation to the old house he remembered more distinctly than any other, and he asked at once of the "big-headed man" he had seen there. This was Peter Van Winkle, the son of the old farmer. Peter had an enormous head, quite as large as a half-bushel measure, if we are to believe the better sort of tradition. He was a helpless cripple, and never could move about except by means of a chair which rolled on wheels; but he was of excellent sense, and Washington, Lafayette and other guests of the house were greatly pleased to converse with him. He lived to the age of forty years and upward, a marvel to all strangers owing to his deformity, being cared for by a devoted slave woman given to his father for that purpose by John Garrison, a relative. Jacob Van Winkle was the great-grandfather of John E. Van Winkle, the machinist, living on Broadway, Paterson.

A gentleman who was with the American army, and who visited the Van Winkle farmstead after the war was over, thus describes what he terms "a natural curiosity:"

"In the afternoon we were invited to visit another curiosity in the neighborhood. This is a monster in a human form. He is twenty-seven years of age. His face, from the upper part of his forehead to the end of his chin, measures twenty-seven inches, and around the upper part of his head is twenty-one inches; his eyes and nose are remarkably large and prominent; his chin long and pointed. His features are coarse, irregular, and disgusting, and his voice is rough and sonorous. His body is only twenty-seven inches in length, his limbs are small and much deformed, and he has the use of one hand only.

"He has never been able to sit or stand up, as he cannot support the enormous weight of his head, but he is constantly in a large cradle, with his head supported on large pillows. He is visited by great numbers of people, and is peculiarly fond of the company of clergymen, always inquiring for them among his visitors, and taking great pleasure in receiving religious instruction. General Washington made him a visit, and asked whether he was a 'Whig' or a 'Tory?' He naively replied, that he had never taken an 'active' part on either side."

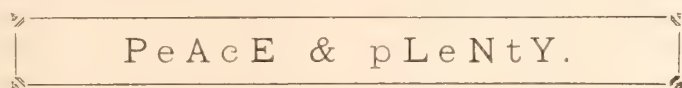
At the time of Lafayette's visit in 1824 Jacob Van Winkle and his son had long passed away, and General Abraham Godwin occupied the old farm-house, which had been transformed into a very superior hotel—for those days. It was known as the "Godwin House," and for years was famous among all visitors to the Falls and others for its good cheer and excellent though homely fare. It was a favorite resort for fishermen, fish being very plentiful and large in the river, attracting many sportsmen from great distances. The sunfish were especially large and fine. A few of the older people remember the rough "free-hand" drawing of two monster fish on the white front of the hotel building in those early years, and how the picture was regarded by gaping yokels as a marvelous work of art.

Just here, at the "Godwin House," in that day the only bridge, a wooden one, crossed the river, there being no other nearer than Passaic, or, rather, at a little distance therefrom. Passing toward Main, then "Park," street, and as far as what is now the corner of Broadway, there was another dwelling, that of Simeon Van Winkle, a brother of Peter, the helpless. This house, also a substantial stone structure, was on what is now the Northeast corner of Main street and Broadway,

and was set back from the latter, then the "Old York Road," about twelve feet, leaving a beautiful green in front—an old-fashioned "dooryard."

Continuing on the York Road, the next house arrived at was the inn of Paul Rutan, the elder, at the corner of the York Road and what is now Carroll street. This was a great resort for horsemen, and racing and horse-talk generally was a fruitful topic at this ancient hostelry. It was familiarly known as "The Black Horse Tavern," a horse's head, rudely painted, being the chief figure on the swinging sign, and by this name it was designated in deeds and other legal documents. The site of the inn was identical with that of the present residence of John E. Van Winkle.

There was another famous tavern on the York Road, near what is now the corner of York avenue and Willis street. Judge Henry P. Simmons remembers this inn as early as 1821, when he stopped there with his father on their way to Paterson from Acquackanonk. The old tavern was known as "The Post Tavern," as the "Bull's Head," from the picture of a bull's head of impossible proportions which appeared on the creaking signboard, and also as the "Peace and Plenty Tavern," from the inscription on the aforesaid signboard. The Judge says the letters were alternately red and blue, large and small, thus :



Mrs. Rachel Van Houten was mistress of the house at this date. Her first husband's name was Post, and she was the mother of John R. Van Houten, a well-known and wealthy citizen of Paterson. It was her last will and testament over which the famous litigation lasting through nearly two decades, and which came to be known as the "Van Houten will case," was had. It was virtually ended some time in 1881. One Halmagh Van Houten, also, was for a time inn-keeper here.

All the Van Winkles named, and many others besides, sprang from one parent stock, to wit, Simeon Van Winkle, who lived in a white house, very old even as far back as the memories of "the oldest inhabitants" extend, and located at a point which would now be Willis street, left hand side in passing Eastward. This old house was built, it is said, about the year 1700, and stood over a century and a quarter, or until 1826-7. This property has since come, in part, into possession of Peter Doremus. Further on, near the junction of Willis street and the York Road, now Madison avenue, was the old Post house, on the site of that until recently occupied by one of the brothers Hewson. This was built by John Post, farmer and carpenter, who kept his slaves at work on his farm while he worked at his trade. Still further on, in following the same course, was a house at the corner of Vreeland avenue and the York Road, at the bend of the latter. This was a fine old farmhouse occupied by Nicholas Van Blarcom, farmer and mason. Between the two last-named, however, lived Michael Vreeland, a farmer, who afterward moved to the lake country. Further on there resided David Blair, better known as "Old Blair," who had a small farm and who secured a wife and much property in marrying one of the old Vreeland family. After passing Blair's, and about one

hundred yards short of Market street, stood the residence of Michael Vreeland, Sr., father to the above-named Michael and father-in-law to David Blair. It is scarcely necessary to state that all the above were farmers, as there was little else to do in those days in this vicinity but to till the soil.

Cornelius Vreeland, a brother to Michael, Sr., resided in a house standing about fifty yards back from Market street and near the river bank. The next residence on the old road was the old Van Riper mansion, the site of the present residence of S. S. Sherwood. About the beginning of the century a man named Hall occupied it, though it was of the Van Riper estate. Afterward John Merselis, of Preakness, bought it. Near at hand was the house of Peter Merselis, brother to John and grandfather to the present Peter, the farms of the brothers joining. Long before this date one Cornelius Van Houten, of Revolutionary times, had resided here but had been ruined in litigation over some valuable horses, belonging to a distant farmer, that were found dead on his premises, and of which no satisfactory account could be given.

Following still the old York Road we arrive at the place where Judge Terhune now lives. This property was purchased by the father of Judge Terhune from the grandfather of Cornelius Post, who resides in Water street, in the First Ward, aged about 82 years, and to whose knowledge of past events and excellent memory the writer is greatly indebted for information of the olden time. Here Mr. Post was born, June 24th, 1800, and here lived his father and grandfather before him.

At Cedar Lawn, just short of the horse railroad terminus, is the site of where Hassel Petersen's house stood prior to 1800. Next came the place of Cornelius Vreeland, owned by Garret Demarest until recently. Both are now included in the cemetery. Next beyond was the small house of John Vreeland, and a little further on that of Cornelius Vreeland, both properties also now enclosed by the walls of the city of the dead.

At a point on the old York Road where it led off in a more Southeasterly direction, there was what was termed the "old *Bocht*" or Bend road, leading to what was known as "The Ford," where the river was crossed without the aid of a bridge, when the water was not too high. The ford was about 200 yards above the present Wagaraw bridge. On this road, after it debouched from the York Road, lived, first, another Simeon Van Winkle; second, a little further on, on the site late of James Van Blarcom, deceased, John Post, in the house afterward occupied by the widow of Halmagh Van Winkle, a daughter of the aforesaid James Van Blarcom; and, third, very near the ford, old Garret Garretson, both house and occupant having long since passed away. Beyond this the road led through the river and thence into one of the earlier settled districts of Bergen County. There was one more old house on this "*Bocht*" road, which must not be overlooked. The location was on the left hand side after turning into the "*Bocht*" from the old York Road, and in front of the present residence of Smith Hill. This, in the early days, was the home of Jacob Van Houten, one of the progenitors of that numerous family.

All Garret Mountain, the surroundings of the Great Falls and a portion of the land on the North side of the river belonged in the latter part of the seventeenth century to the Garrisons, one of New Jersey's very first families. In those primitive

times the son was frequently called by the name of the father with merely a suffix added, as Sander's son, which afterward became Sanderson; Garret's son—Garretson—Garrison, etc. In this wise the first owner of that most unpromising section to which reference is made, whose name was Garret, in due time gave place to descendants who were named successively Garretson, and, finally, Garrison. From the original owner the name Garret Mountain was received. Henry Garrison, who owned the aforesaid demesne during the last decade of the 17th century, was a great man in his day, though he might not be so regarded now, since the country, and especially New Jersey, is full of great men. He had assisted as a legislator in making the laws of the State and was a man of note and importance. It was from him that the Society for Establishing Useful Manufactures purchased a large tract in which are included some of its most valuable as well as some of its most unproductive possessions. Henry had a son, also named Henry, who was not at all bright like his worthy parent, and consequently the property was alienated from him and divided between two daughters and a grandchild, John Garrison, son of one of the aforesaid daughters. One of the daughters married Henry Kip, who owned a large property at the Boiling Spring, near Rutherford; the other married Garbrant Van Houten, who built the house where Henry and Ralph Doremus lived, the fine, large "double-hipped" stone house on Water street, near the old Bensen house before referred to.

For many years the only bridge over the river anywhere in the vicinity was that to which reference has been made as spanning the river from a point contiguous to the Passaic Hotel, formerly the Godwin House, and, at a still earlier day, the old Van Winkle farmstead, to the Northern side, in front of the old David Bensen place. This bridge was of wood, and a very substantial structure. Here the old York Road terminated, and, after the Hamburg Turnpike was built, this "pike," which followed the present line of West street from a point which is now the intersection of Broadway and Main street, took a turn at or near the river, and led also to this only place of crossing. In 1810, when the great freshet occurred which swept away a portion of the old Passaic Hotel, this bridge was carried away, though the people collected and rolled great rocks on it to hold it to its place. This left no facility for crossing—the bridge near Passaic also having shared the same fate—nearer than Belleville until the bridges could be rebuilt. When the flood came a man named Uriah Van Riper, living then on or near the site of the present residence of Smith Hill, near Weavertown, in an old stone house, was caught on the Northern side of the river, and though he could look across and see his house in the near distance he was obliged to go all the way around by Belleville to reach it. This was the greatest flood ever known in the Passaic, and it should be remembered that at that time the river was free from the many obstructions that have since impeded its course, promoting damage in times of high water. The first bridge ever built at West street, for the Hamburg Turnpike, was in 1834, a wooden structure of one span, which fell of its own weight when but one or two had crossed on it; some say that no horse had ever been driven over it before it fell into the river.

CHAPTER VI.

OLD TIME STORES AND STOREKEEPERS.

EVERY house erected within what are now the city limits prior to the existence of the Society has now been noted, except two or three; two where stores were kept and one where a sort of primitive school was maintained. A personage known as old Conrad Van Winkle kept a store at the turn from what is now West street at the bridge, on the "Essex County" or Southern side of the river, whence the road led down along the river bank to the old Godwin House. This store was in an old frame building, and the tradition is that a portion of the old timbers were afterward incorporated into the turning shop of Chauncey Andrews, on the same site, and that it still forms a portion of the old tumble-down building at that point long occupied by George Broomhead as a wire works. Here, in the days when old Conrad Van Winkle sold "specht" (pork) and "strope" (molasses) and tallow candles and snuff and tobacco and whiskey, and other of such luxuries as our fathers and mothers permitted themselves, the few "men-folks" of the scant and scattered settlement met in this store and talked Federalism and Jeffersonian Democracy and the like with all the energy begotten of strong conviction and potent "applejack." Another store was kept at the junction of Main, then "Park," street, and the present West street, the site of "The Branch." This was the store of old Simeon Van Winkle, and he was afterward succeeded by his son Jacob Van Winkle, and the brief sketch of that at the river bank will answer very well for this, both establishments being of the most primitive sort.

Apropos of the early stores and store business in Paterson, it may be added that there was a very notable store kept by David Bensen, heretofore mentioned as living in the fine old stone mansion still standing on Water street between the two bridges, and his nephew, John Bensen. The location of this early store was on what would now be the corner of Water and Northwest streets, opposite the present residence of Judge Sanford; at that day it was the corner of nothing in particular. The old frame building is still standing, though it must have been built during the last decade of the preceding century, but it has been removed to the rear of the old Bensen mansion, in the stable yard, where it is devoted to a less important use than as a commercial centre. It is not easy to obtain any definite knowledge as to the time when the Bensens commenced business here, but a daybook in

use from February 10th, 1809, to August 29th, 1811, when the concern closed, is still in existence. Looking over the accounts, kept very neatly, in this old book it is found that the prices at which goods were sold in that day were as follows :

Pork was about a shilling a pound, rye flour 35 shillings a hundred pounds, sugar one shilling a pound, calico fifteen pence per yard, soap one shilling fourpence, coffee three shillings a pound, candles one shilling tenpence per pound, molasses five shillings a gallon, salt four cents a quart, tea seven to nine shillings, butter one shilling and sixpence, a quarter of lamb four shillings, rice one shilling sixpence for seven pounds, wheat flour three shillings for seven pounds. To our foreparents wheat flour was a luxury to be indulged in only on extraordinary occasions ; rye was in common use, being grown hereabout, while wheat was not, at that period. A load of wood cost five shillings, cheese a shilling a pound, a broom one shilling ninepence, tobacco sixpence a paper, muslin four shillings a yard. Brandy was one shilling sixpence a pint, "spirits" five shillings a quart, gin three shillings a quart, rum one shilling a pint, etc. By the way, those old people seemed very fond of all sorts of "fire-water," for scarcely an entry appears in this old book in which either rum, gin, spirits or the like does not appear, and frequently spirits, the "jugg" in which to carry it, pieces of pork, "scanes" of silk, needles, thread, cider, molasses, fishhooks, calico, cordial, tobacco, cloth, gin, glassware, rope, corn, nails, axes, handkerchiefs, gloves, indigo, knitting needles, lozenges, hooks and eyes and other incongruities are found mingled together in the charges made on this daybook. Pork, rum and tobacco predominate throughout from beginning to end. On one page, taken at a venture, the charges for the various kinds of spirits foot up £1, 9 shillings and 8 pence ; while all the other charges taken together amount to but 14 shillings and 4 pence. This is not, probably, the proportion on every page, but the liquor charges are wonderfully frequent throughout.



CHAPTER VII.

EARLY STAGES AND STAGE-DRIVERS.

AN announcement which appeared in a "Supplement to the *Gazette and Weekly Mercury*," printed in New York on Monday, November 28th, 1774, shortly before the country was convulsed in the throes of the first and greatest Revolution, sheds some light on the facility for travel in that day. In this old time-stained paper is found the following advertisement having reference to what afterward became Paterson:

"This is to acquaint the public that there is a stage-waggon erected to go from the house of Abraham Godwin, near the Great Falls, to Powles Hook, through Schuyler's Swamp, twice a week, on Mondays and Thursdays—to set out on every Monday at 8 o'clock in the morning, and return the next day, at ten o'clock in the morning, from Powles Hook to said Godwin's, and likewise on Saturdays and Fridays at the aforesaid hours. The price of the stage is two shillings and ninepence up or down. By this road the distance from the Falls to Powles Hook is only 19 miles."

This was nearly twenty years before the hands of men had desecrated the natural beauty of the Great Falls by diverting the course of the stream to the inglorious and unromantic purpose of turning cotton spindles, and this "stage-waggon" must have been "erected" soon after the establishment by the elder Abraham Godwin—afterward the proprietor of the Passaic Hotel, at this time the Van Winkle farmstead—of the first public house in this neighborhood, for the accommodation of those who were desirous of visiting the wild and romantic scenery at the Great Falls of the Passaic. There is no record how long that old "stage-waggon" continued to run, or whether it ever changed its route, but some of the older citizens are positive that about the year 1800 and up to 1806 the only road leading to New York was the "Old York Road," to a certain distance identical with the Broadway of the present day, leading from the Godwin House to the Passaic at the "Old Merselis Corner," thence down the river to the Landing, and from thence through Belleville to Jersey City, then known as "Powles Hook." It was on the 3rd of March of the year 1806 that a charter was granted to form a turnpike road from Paterson Landing through Paterson to Hamburg, which road was first finished to Paterson, and later to Hamburg.

Soon after this road was completed the people of the section through which it

passed were doubtless delighted to have a two-horse stage line established to run twice a week to Jersey City, passing through Belleville, which enterprise was carried out by General Abraham Godwin, the elder, and Benjamin Vincent, who continued running twice a week for about six months, when they were compelled to discontinue for lack of adequate patronage.

The next man to enter the field and furnish a public conveyance of this sort was Noah Sexton, an enterprising Down-Easter, who put on a two-horse stage running twice a week for several years, when it became necessary, on account of the increase of travel, to add another pair of horses, with which he continued to run the stage over the same route until after 1816, when the Paterson and Hamburgh Turnpike was extended from the Landing over Berry's Hill to Hoboken, which so greatly lessened the route that people could go down with the stage and return the same day—a most satisfactory accommodation. It would appear from the accounts given by aged citizens that the facilities for travel were not greatly improved within the next quarter of a century. An incident of stage travel which occurred some time prior to 1830 will illustrate. Roswell L. Colt desired greatly to reach Hoboken and cross the Hudson river to New York in time to embark in the packet for Baltimore, where his wife, formerly a Miss Oliver, then was. He was engaged at the time in building the palatial residence on Colt's Hill and had frequently been driven to and from Hoboken by Peter Sloat and by Samuel Pope, his successor, both noted "whips" of that early day, and who are still living to relate their exploits. The former, who is aged nearly fourscore, almost any fair day may be encountered sitting in the doorway of Titus' stables, Hamilton street, because he loves the breath of horses and to talk of the good old coaching days. It was Mr. Sloat who achieved the "rapid transit" referred to. He had driven a stage for all the first proprietors—including Sexton—before named as having ventured on a weekly or semi-weekly stage to the Hudson, and at the time in question was driving for "Brom" Van Blarcom, who was, so the picture is drawn, "a leetle quick-tempered at times."

There was but a trifle more than two hours left before the boat would start from New York for Baltimore, and there would not be another in a week, when Mr. Colt sought Mr. Van Blarcom and asked if his horses could make the distance in two hours. The stage proprietor said it was a big drive but thought it could be done, though it never *had* been done. The distance was estimated at between fourteen and fifteen miles, the route lying through Germantown, now Carlstadt, and thence across the salt meadows, where there was but a thin layer of dirt and the water and mud would in places rise to the hubs. It was not the distance, for fifteen miles was no heavy drive in two hours, but the condition of the roads taken into consideration it was a real feat to undertake. The coach was a heavy one. There were eight passengers, six "insides." Mr. Colt was pressing and, so the story runs, paid a large bonus. Then Van Blarcom called out, "Peter!" And now that "Peter," otherwise Mr. Sloat, is introduced, he may tell his own story :

"When I came to the stables Mr. Van Blarcom said : 'Bring out the four grays.' Then I knew that there was business to be done, for they were fine animals and speedy. When all was ready Van Blarcom said, 'Now I want you to make Hoboken ferry inside of two hours. Don't spare the horses—*do it*.' 'All right,

sir,' said I, and I sung out, 'All aboard,' and climbed up on the box, and when all was stowed drove slowly up the street, on a walk. Near where the First Presbyterian Church stands there was a great sand hill, so close to the road that the whiffletrees scraped it. I drove slowly around this and turning the curve gave the horses the word and on we went. When I drew up at Acquackanonk the tavern-keeper came out and wanted to know what I meant by driving my team in that fashion. All the answer he got was an order to dash some water over their foaming fronts, sponge out their mouths, but not allow them to drink a drop. Then I drove on. At every stage it was the same; they wanted to know if I was trying to kill the horses, and several even talked of stopping me, but I pushed on. Arriving at the top of Weehawken hill, I looked at my watch; either twenty-one or twenty-two minutes of the time was left. Then I touched up the leaders, spoke a word of cheer to the left wheeler, who was drooping a little, and dashed on for the ferry. We got in sight of the boat just as it was about to move out from the slip. I beckoned to the captain to stop, and he held the boat. It lacked several minutes of the two hours, and by catching that boat my passengers were landed in New York within the two hours, and a gladder man you never seen than Mr. Colt. He gave me a dollar and two of the other passengers gave me a half dollar each, and when I got back to Paterson Van Blareom came out to the door and looked all over the horses, then looked at me, and then he asked: 'Did you make the time?' Then I up and told him all about it. Then he called two lazy niggers loafin' about the barn and bid them take care of the horses, and told me to go in the kitchen, telling the cook to give me a good dinner. When I came out he gave me a dollar and a two days' holiday and my pick among four good saddle horses in the stable, bidding me put a saddle on and go where I would. Ah, them were the good old days, afore stage-coachin' was gone out of fashion."

Samuel Pope is, in many respects, a remarkable man. He is of almost gigantic stature, six feet six-and-a-half inches in height, and is of proportionate mould throughout. His great force of character, tremendous energy, blunt, straightforward manner and robust honesty would make him a man of mark in any community. He is a notable representative of the sturdy men of iron will and physique who seem to have been intended to pioneer great enterprises and assist in founding new communities.

Mr. Pope was born October 9th, 1811, and is therefore nearly seventy-one years of age. He is the youngest of two sons of Samuel and Lizzie (Edwards) Pope. His only brother died thirty years ago. His grandfather fought in the Revolutionary war, and receiving seven buckshot and a bullet in his body in a skirmish near Fort Lee was taken to Hackensack, where, by the merest chance, he was nursed by the patriotic young girl whom he afterward married. Early in the century the whole family removed from Hackensack to the lake country in central New York, whence both the father and grandfather of the subject of this sketch went forth to engage in the war of 1812. Both fought side by side under General Scott at Lundy's Lane and elsewhere. Subsequently both were seized with camp fever and died, in 1813, when the young Samuel was about two years of age. The remnant of the family soon after returned to Hackensack, and from there Mr. Pope as a lad found his way to Paterson and was employed in the cotton mills of John Colt, John Travers, J. Velasquez and others. Later he became noted as a stage driver on several of the early lines, and finally, when the Paterson and Hudson River Railroad was opened, in 1833, he became agent for the Hoboken Stevenses



James K. Polk

and ran an opposition line, not infrequently beating the railroad time, the passengers by railway being conveyed over Bergen hill in horse cars, there being no tunnel until long afterward. The time by either route, to Jersey City or to Hoboken landing, was about two hours and a half. Mr. Pope, by changing horses at the "Half-Way House," could usually get in ahead, except when the mud was deep. Still later he continued the opposition line on his own account, driving the best horse-flesh to be found, shortening the time, and charging passengers two shillings and six pence each way—much less than the present fare by railway.

After the coaching days were over Mr. Pope was employed in locomotive-building, assisting to set up the "Sandusky", the first locomotive constructed at the Rogers Works, and in later years he was engaged largely in quarrying and masonry. He built many enduring structures, including a factory of the Gun Mill group, a portion of the works at the pumping station of the Water Works, the great wall about the Colt's Hill property, and many others. He furnished the material for building the County Jail. He was also largely engaged in the wood and timber trade, purchasing many thousand acres and stripping them of the wood. At one time he had about 5,000 acres adjoining the lands of Cooper & Hewitt, in the Northern part of the county. Meantime he amassed wealth and became possessed of valuable properties in and about Paterson.

Being of such unusual stature, Mr. Pope early asserted his right to the franchise, voting for General Jackson for President when he was aged but seventeen. He began and has remained a Democrat. He became a figure in local politics and held many offices, at different times. He was Street Superintendent under both village and city governments, was Assessor and Collector, and in 1851-2 was a member of the first City Council and also City Treasurer, signing the first municipal bonds issued. He was paid the munificent sum of \$200 per annum for his services as Treasurer and himself paid \$300 yearly for clerical help, besides furnishing the office in which to transact the business, fuel, lights, etc. He was a member of the State Assembly from 1857 to 1863 inclusive, except in 1862. In the performance of all his public duties Mr. Pope was noted for his uncompromising integrity and thorough honesty. He long since retired from all active business.

On the 23rd of January, 1828, a charter was obtained for the turnpike road leading to Little Falls, and soon after the subject of railroads began to occupy the public mind. On January 31st, 1831, a charter for the Paterson and Hudson River Railroad was obtained, on the 22nd day of April in the same year the surveyors commenced work, on the 4th of July ground was broken on the Paterson terminus, on June 1st, 1832, the cars were run to the Landing, and on November 24th, the same year, the road was opened for travel to the junction with the Newark road on Bergen Hill, the work being finished in nineteen months and two days. It is worthy of remark that the bridge then built over the Hackensack river was the first railroad draw-bridge ever constructed. Ex-Governor Philemon Dickerson was first president of the company. From about this date the occupation of the old-time stage-driver was gone—so far as the line between Paterson and the Hudson river was concerned.

CHAPTER VIII.

THE SOCIETY FOR ESTABLISHING USEFUL MANUFACTURES.

THE chief circumstances, apart from the industrial features, under which Paterson was founded have now been outlined ; also its early settlement and subsequent history to a date about a half-century beyond the inauguration of the manufacturing era. The history of the establishment, growth and present status of the various manufactures may now be continued uninterruptedly, with consecutiveness as to time, place and circumstances that will prevent the confusion that would otherwise have been almost inevitable.

Imbued alike with the sound sense and patriotism that marked those early days, the leading spirits who had been foremost in achieving the formation of "a more perfect Union," immediately after the War of the Revolution began to turn their attention to the fabrication of those articles pertaining to the domestic necessities and everyday life of the people. The founders of this Republic understood that, in order fully to enjoy the benefits of that independence which had been secured through almost unheard-of sacrifices, measures must be adopted looking toward the production of, at least, cotton, linen and woollen fabrics and other articles of prime necessity. With this end in view Colonel Alexander Hamilton and a few others, who had seen and felt the trials of the past, and had the sagacity to look into the future, early in the year 1791 determined to lay the foundation of a system of domestic manufactures and applied to the Legislature of the State of New Jersey for aid. This was granted, and on November 22nd, 1791, a charter which had been drawn up and revised by the great Hamilton himself received the signature of Governor Paterson, and under it was formed The Society for Establishing Useful Manufactures, familiarly known as the "S. U. M.," which body may with propriety be regarded as the parent and the date of its incorporation as the birth of "Industrial Paterson."

It seems eminently proper to pause just here, at the very dawning of the industrial age—an age of activity in manufactures unknown before—an age in which man's inventive powers are subduing all material forms and forces, and are driving out and annihilating all rude and primitive processes of industrial production—an age whose history possesses all the charm of romance, and the contemplation of which must always be interesting and valuable to the student of human development and progress—to contemplate for a moment the almost incalculable importance

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of the initial step then taken in the since triumphant march of industrial empire. The gratitude of a prosperous and wealth-producing community is surely due to the wisdom and patriotism of those far-seeing men who were the projectors of a system which has cut down the forests, and chained the waterfalls, and lighted the fires of an hundred furnaces, and built up populous cities, and filled them with mills and factories from which daily issue the ever-increasing hum of the whirring spindle, the sound of the busy loom and the clangor of iron smiting iron, giving assurance of, not only bread and shelter, but the comforts and ownership of homes to the teeming thousands employed in the varied industrial activities which make Paterson what it is to-day, one of the first manufacturing cities in the Union. The result, as viewed at this date, nearly a century after the movement was begun, abundantly illustrates the wise foresight and sagacity of the founders of the city, the growth and prosperity of which they could scarcely have dreamed.

The charter granted to the Society for Establishing Useful Manufactures was of the most liberal character, leaving the grantees unrestricted as to locality, time of commencement or period of duration—almost a *carte blanche*. The capital stock was fixed at \$1,000,000 in shares of \$100 each, but real estate and other property might be held to the extent of \$4,000,000. Besides manufacturing they could improve navigation by the construction of canals, lakes, dams, etc., and charge tolls. Their property was exempt from State tax for ten years; from local taxes, such as for county or township purposes, forever. They were also granted the privilege of raising \$100,000 by lottery if required. The inhabitants within a district six miles square might at any time be incorporated and form a municipal government, with the usual powers, privileges and duties.

The organization was completed at New Brunswick on the last Monday in November, 1791, by the appointment of William Duer, John Denhurst, Benjamin Walker, Nicholas Low, Royal Flint, Elias Boudinot, John Bayard, John Neilson, Archibald Mercer, Thomas Lowering, George Lewis, More Furmans and Alexander McComb as Directors. William Duer was chosen as the first Governor and Archibald Mercer as Deputy. The stock subscriptions then amounted to \$200,000 and were soon increased to \$262,000. The original and uppermost idea was, without doubt, the manufacture of cotton goods on a large scale, but the production of other necessary domestic articles also was contemplated.

Nature evidently formed and set apart the region about the Great Falls of the Passaic as a vast theatre for manufacturing operations, and that particular locality as the centre toward which all the natural advantages should tend. Looking for the moment to a little distance from the more immediate surroundings of Paterson, it is found that in the contiguous mountains she locked up inexhaustible deposits of iron ore of the best quality and easy of access, while the sides and summits were clothed with dense forests. The plains she spread out on a ground floor of old red sandstone, here and there showing itself in graceful elevations or modestly hiding underneath tall, grim and stately cliffs of grey trap, which she drew in vast lines parallel to the shore of old ocean. The best of harbors and the furthest navigable of Atlantic rivers were placed within reach of the eye; several mountains

rising from 200 to 2,000 feet approached very near to the margin of "the great deep," and across these the beautiful Passaic was diverted so that at each of the passages it precipitated itself from 50 to 100 feet. It needed only that human intellect and skill take advantage of all the arrangements of bounteous Nature to render this favored portion of the State one of the most productive and wealthy, as well as the most picturesque region on the face of the globe.

These remarkable features, fortunately for the future of Paterson, were not overlooked by the newly formed Society, whose first business after its organization was to select a suitable location for its proposed enterprise. Advertisements were inserted in New York, Philadelphia and Trenton papers, inviting proposals. These were received from the West Jersey Association, from South River, Perth Amboy, Millstone, Bull's Falls, the Little Falls and the Great Falls of the Passaic, setting forth their several advantages. Engineers were then sent out to survey and report upon each. An eminent engineer, Cassimer T. Grover, Surveyor of New York, estimated the power of the Great Falls, with its elevation of 104 feet above tide-water, as equal to driving 247 undershot wheels; that of the Little Falls as equal to driving 78. Besides the excellence of the quarries and abundance of timber, the practicability of improving navigation to the headwaters of the Passaic was duly pointed out, and the Directors were informed that bog iron ore was found near Little Falls sufficient for very extensive works; also beds of red ochre, etc. It is noticeable that all the early surveys contemplated the conveyance of the Passaic by canal to tide water near Acquackanonk. Christopher Collis stated that a cutting of fifteen feet only would be required.

A meeting of the residents in the Northern part of what was then Essex County was held at the house of John Stagg, Acquackanonk, when a committee consisting of John Benson, William Colfax and Abraham Godwin, all large land owners and noted as progenitors of future industrial pioneers, was appointed to confer with the Society. They were to point out the abundant supply of everything needed for a great manufacturing centre, and to offer part of their lands—every alternate three-acre lot—at a reasonable valuation; also, it was resolved that a portion of these might be given gratuitously, if nothing better would serve. A meeting was also held at Little Falls, whence propositions were submitted for acceptance. Governor Duer appears to have favored the latter, but a committee to whom the subject had been referred thought differently and on May 17th, 1792, resolved that the town of Paterson (named after the Governor of the State) should be located at the Great Falls of the Passaic. A committee to lay out the town of Paterson, which some insisted should be named "Hamilton," after the indefatigable statesman and zealous projector, was appointed at a meeting held July 6th, in the same year, consisting of Directors Low, Bayard and Boudinot, and they were authorized to borrow \$70,000 on the stock of the Society for that purpose.

At this same meeting, which was the first held at Paterson, the committee reported that they had visited the Great Falls, in company with Gen. Schuyler, and found it practicable to convey the water to Acquackanonk, but on consulting with Colonel Hamilton it was judged best to erect their works at the Great Falls, and for this purpose sufficient lands had been obtained. A resolution was accordingly

adopted that measures be taken to bring the water "across the gap to station No. 14," and there erect a cotton mill, also buildings for carrying on calico printing, with requisite machinery, together with buildings to accommodate the workmen. The sum of \$20,000 was appropriated for the canal, \$15,000 for the cotton factory and machinery, \$12,000 for the print works, and \$5,000 for a weaving shop and its equipment. A purchase of nearly 700 acres of land, together with the river bed above and below the Great Falls, was made at a total cost of only \$8,230. There were later purchases also of plots that were desirable for one purpose or another—and there were sales as well—up to the year 1819. Following is a list comprising the more important parcels first purchased; also the names of the original holders, the land owners of "ye olden tyme," as found on the Society's minutes of that date: John Van Blarcom and wife, 5 acres; John R. Van Houten and wife, 12½ acres; Henry Post, 42½ acres; Cornelius Van Winkle and wife, 10¼ acres; John J. Post and wife, 22½ acres; Abram Van Houten and wife and John R. Van Houten and wife, 45½ acres; Anthony Van Blarcom and wife, 28 acres; David Blair and wife, 36¼ acres; Jacob Van Houten and wife, 55½ acres; Jabez Johnson, administrator of Abraham Godwin, deceased, one-half acre; Ebenezer Blatchly and wife, 23½ acres; John Willis and wife, "Wesel mountain tract;" John J. Post and wife, 18 acres; Nicholas Van Blarcom and wife, 38 acres; Cornelius Van Winkle and wife, 125½ acres; Simeon Van Winkle and wife, 20 acres; John Van Gieson, 1 acre; Abraham Godwin and wife, 1½ acres; Ebenezer Blatchly and wife, 2 acres; Halmagh Van Houten and wife, 6 acres. The price paid is found by a careful examination to have averaged about £10 "York" money, or about \$25, per acre.

Among the first necessities of the new enterprise was skilled labor, and very soon after the Society was formed steps were taken to engage the services of a superior class of workmen. A letter from Colonel Hamilton, written in the latter part of 1791, and which is still extant, announces that he had secured a number of what appeared to be men of excellent ability in their various departments, to assist in the establishment and operation of the projected industries. This communication was laid before the Board of Directors January 17th, 1792; the text is as follows:

PHILADELPHIA, Dec., 7, 1791.

GENTLEMEN:—In consequence of powers vested in me by the agents named in the instrument of subscription towards the Society for Establishing Useful Manufactures, I have made contracts on behalf of the society with William Hall as superintendent of the Printing business; with Joseph Mort as an assistant in the manufactory in such a way that his services may be thought most useful. This gentleman, I understand, has had opportunities of being acquainted both with the making and printing of cotton goods. With Thomas Marshall to superintend the Cotton Mill.

The contracts with these different persons are transmitted herewith.

There is a William Pierce who has been employed by me in preparing machines for the use of the society, and with whom I have advanced pretty far in an agreement, but without having reduced it to a definite form. He pretends to a knowledge of the fabrication of most of the most valuable machines now in use in the cotton manufactory, and his execution hitherto, so far as he has gone, confirms his pretensions. Among other machines he has prepared a Double Loom, to be worked by one person. Of this he gives himself as the inventor, and has applied for a patent, which he will probably obtain. It is certain that the machine, if in use at all in Europe, is quite new; and as far as without seeing it worked it can be judged of, promises to answer the expectation it gives. With Geo. Parkinson as Foreman or Master of a room in the Cotton Mill. This appears to be an ingenious mechanic who has obtained a patent for a Flax Mill, which he alleges his having improved. How far these improvements may be of real utility, or the Mill itself capable of answering its end, ought to be considered uncertain, since it is a question whether the spinning of flax by mills, which has been for some time a desideratum in Great Britain, is practicable. The object of engaging this man was to secure to the society an ingenious mechanic, and securing to them whatever advantages there might be in the patent.

All the contracts leave to the society the power of dismissing at pleasure, if on experiment they find it their interest.

I thought it advisable, in the first instance, to secure persons of whose usefulness there was reason to entertain a favorable opinion, though upon terms which may appear high, that the business might be early put in motion.

It is a point understood between Mr. Mort and myself that, if desired by the society, he is to go to Europe and bring over workmen, at his own expense in the first instance, but with the assurance of reimbursement and indemnification. To engage such a person as Mr. Mort for this purpose appears to me a point of some consequence.

Gentlemen, I have the honor to be, with great consideration,

Your obedient servant,

A. HAMILTON.

To the directors of the Society for Establishing Useful Manufactures.

It is found by referring to the records (in the form of original minutes of the meetings held from 1791 to the present date), still to be seen in a state of excellent preservation at the office of the Society, that the building of fifty houses "of clay and stone, pointed, unless the cost be found to exceed by 30 per cent. that of wood material," was authorized at about this time; each house to be 24x18 feet in size, with 12 feet posts to the plate, and with cellar and garret. That is to say they were to be substantial one-story houses. The estimated cost was to be \$8,500; and with each house a quarter-acre of ground was to be allowed, the value to be fixed at \$250 for each house and plot. These houses were to be leased for a term of from one to twenty years to any "proper mechanic married and of good character," at a yearly rental of \$12.50, payable quarterly, and any occupant under lease could become owner by purchasing at the value fixed and paying in easy instalments. Lots of a quarter-acre could be had on the same terms at \$88 each. It was also ordered at the same meeting that \$800 be appropriated for a saw-mill with two saws, to prepare the abundant timber of the vicinity for use in building, etc.

Immediately after securing the land for the site of the future city Nehemiah Hubbard was appointed the Engineer and Superintendent, to lay it out properly. He was soon succeeded by Major L'Enfan, a Frenchman of very extravagant ideas. In his first report, still extant, this gentleman recommends the water to be conveyed in a canal to the Great Notch, a distance of three or four miles, before using it! His magnificent and impracticable ideas were soon abandoned, although, according to the record, he remained in the service of the Society until succeeded by Peter Colt, early in 1793. L'Enfan had laid out the city of Washington, D. C., and, apparently not appreciating the difference in the conformation of the surface there and in the rugged locality about the Great Falls, he proposed to run streets and avenues 200 feet in width at right angles, regardless of rock, hill or stream. At that time such was the enthusiasm that many really believed that at the location selected by the Society all the manufactures of any account in the Union would finally centre. And this was scarcely to be wondered at. The country was still in its helpless infancy, prostrated by the great struggle through which it had recently passed, and with all the glorious future unknown. This was the first organized attempt to establish anything like an industrial centre, and none of the accessories seemed to be lacking here to assure the success of the undertaking. How should any have dreamed at that time of what this country was destined to become? Contiguity to the then, as it is now, great commercial centre, eligibility of location in a general sense, and almost unlimited water power—all these and other advantages could not

be denied, and it was not so very remarkable that those early projectors of "Industrial Paterson" should "dream dreams" even more wildly sanguine than were destined to be fulfilled.

The changes made at and about the Falls since the date when the Society began its operations are almost inconceivable. At first a slender dam was built 200 yards higher up stream than the present one just above the Falls; this was at La Fontaine's Gap, near the bend of the river, the ravine being converted into a reservoir, out of which the current passed into what is now the middle race-way. Along this it was conveyed 150 yards to the Society's first factory, off Mill street at the corner of Passaic, as those streets were afterward laid out. The immediate neighborhood, then and long afterwards consisting of a low swamp through which several rivulets pursued their devious courses, is now the most populous portion of Paterson.

The present existing dam was constructed in 1838-40 of immense blocks of stone, bolted together to their rocky bed with powerful clamps of iron. The water is thus diverted into an artificial channel constructed across the deep ravine and through the rocks, which barely permits its passage. From this point it is made to turn in succession three tiers of factories, the height of the fall allowing three race-ways, the water being used successively that number of times, after which it is once more discharged into the river, at the distance of scarcely half a mile from the point of leaving it. The new dam was built by Bernard Hartley.

The Great Falls of the Passaic, or "Passaich", as it was called in the early days, has the extraordinary water-shed of over 800 square miles. The minimum supply for mill purposes in a dry season is fifty square feet, the average flow of course being vastly greater. The aggregate horse-power is 2,640. Much the greater portion of the water power still remains the property of the Society for Establishing Useful Manufactures.

In 1876 there was in use on the upper raceway 34 square feet of water, and on the middle and lower raceways 33 square feet each, making 100 square feet in all. Previous to the panic there were four square feet more in use on the upper, seven on the middle, and four on the lower canal. In 1878 four square feet additional on the middle and four on the lower raceways were leased, to Hamil & Booth and others, making 37 square feet in use on each of these, or 108 square feet in all.

In its leases a square foot of water is estimated by the Society to equal 17 horse-power. The Society estimates its total water supply to equal 2,108 horse-power, 1,836 horse-power being now in use; not used at present, seven square feet, or 119 horse-power, and nine square feet or 153 horse-power never yet rented or in use. The estimates of manufacturers are that a square foot of water is equal to 21 horse-power gross, and 16 horse-power net. The Society owns rights and franchises for water storage by which it is claimed the present supply could be quadrupled if necessary. It is estimated that the average annual rental received by the Society per square foot is \$750. The estimate of manufacturers of the average cost of the water is \$37.50 per horse-power per annum.

In reference to the water-power controlled by the Society, it should be stated that it was in order to fully avail itself of the benefits of this remarkable advantage

that the tract of about 700 acres was purchased adjoining and contiguous to the Great Falls, and on which most of the mills and the principal part of the city was first built. And it is worthy of remark, for it may be important hereafter to know, that in selecting this place the management of the Society took into consideration the fact that artificial reservoirs of water might be formed at the different lakes or ponds on the head waters of the streams tributary to the Passaic, for the purpose of keeping up the supply of water during the dry season of the year. To a certain extent this has since been done.

The building of the first dam and the use made of the ravine as a reservoir, also the erection of the present dam, built about 50 years later, have been noted on a preceding page. Under the first arrangement the water, after turning the wheel at the first factory, off Mill street at the head of Passaic street, flowed away diagonally, crossing Mill street and the common beyond, then called "the Swamp," and entered the river near the present Phoenix Mill. About seven or eight years later this race was extended along the side of the hill to supply some mills about to be erected near the corner of Mill and "Boudinot"—now Van Houten—streets; afterward it was continued down "Boudinot" street as it was required to supply additional mills.

The fact that the important water franchise and a great part of the land on which the city of Paterson is built were held by the Society under perpetual charter, with provisions exempting from tax and granting in all respects very sweeping powers, including the right of exercising municipal government over several square miles of territory, has been regarded by some as a very great disadvantage and as having retarded the growth of the city at an earlier date. It was held that, however desirable it might have appeared at the time to fortify the corporation with liberal and even extraordinary powers, in order to build up an important manufacturing interest, it was not wholesome to have the shadow of a single association hanging over the place, even though there was clearly a unity of interest. From the first this was a source of dread, and the policy of the Society, however wisely intended, was always the subject of more or less criticism and complaint. It was claimed that the high rates demanded on leased water privileges, as for the mill sites owned by it, not only discouraged but in some instances drove away from the place wealthy men and strong corporations who otherwise would gladly have located here. The current method of leasing, for a term of twenty-one years, with a right of purchase, was regarded as pernicious in the degree that under this system the Society had the power to exact higher rates than were equitable or profitable to purchasers. In 1845, however, the Society removed the barriers by selling outright in fee and taking in payment United States Bank notes at par, which could be obtained at a discount of fifty cents on the dollar. Extensive sales were made under this arrangement, and an open market and a proper criterion of the value of real estate were established, giving a sad blow to the holders of property at the old leasehold rates. The result on the prosperity of the young city was, however, most salutary; from that day the Society lost the power of controlling the price of real estate, excepting that bounded by the raceways.

Among the evils with which the Society was assailed very soon after its incor-

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poration was the dishonesty of several of its officers who occupied positions of especial trust. At a meeting held October 2nd, 1792, it was reported by a committee of investigation appointed to inquire into the defalcation of John Denhurst, one of the first Board of Directors, that he had been intrusted with \$50,000 to purchase materials in England, including plain cloths for printing, and that he had failed owing to the insolvency of parties to certain bills of exchange. A grave discussion followed, and a "special boat" was ordered to proceed to England with a reliable representative of the Society to endeavor to recover the large sum "in jeopardy." This was done, but without avail. This meeting was held at "Clark's Hotel," in Paterson. Under date of July 7th, 1794, the minutes of the Society's meeting state that Benjamin Walker, Secretary, was directed to withhold the issue of certain certificates for shares of stock which the first Governor, William Duer, had paid for, "unless he account for deficiencies." \$14,500 was kept for Archibald Mercer's shares. The Society is said to have lost about \$10,000 by Duer. There were other defalcations also, but of a minor character.

Major L'Enfan remained in charge of the works until early in 1793, though a change had long been considered necessary. At a meeting of the Directors held January 1st, 1793,—those good people seemed to care not a whit for the holiday—Director Bayard, who had been appointed a committee to secure a proper Superintendent, reported that he had communicated with Peter Colt, the Treasurer of the State of Connecticut, and it was resolved to hold a special meeting on the second Tuesday in February in order to complete the arrangements. The meeting was held, and Mr. Colt engaged to take full charge and oversight and to manage the works "as if they were his own property." His salary was to commence February 7th, the date of his leaving his native State, and his remuneration was fixed at \$2,500 per annum, a heavy sum for those days. Major L'Enfan was dismissed a few months later. Mr. Colt remained in full charge until adversity compelled the Society to succumb. Soon after his arrival he represented to the Directors that he wished to know what the nature of the engagement was to be, as to its permanency. He had a large family and did not wish to remove them unless assured of an engagement of some length. He was then formally engaged for three years at the above-named salary; he continued to direct the operations of the Society until the collapse, May 7th, 1797.



CHAPTER IX.

OUTLINE OF EARLY INDUSTRIAL OPERATIONS.

A history of the Society for Establishing Useful Manufactures must, of necessity, include that of the earlier industrial operations, but, inasmuch as the end attained is of more consequence than the means used toward such attainment, the chief prominence should at this point doubtless be given to the former ; hence the title of this and subsequent chapters, in which much that pertains to the further career and after fortunes of the Society will be blended with the record of industrial progress.

The first cotton yarn produced by machinery in the State was spun in the Summer of 1793. This was accomplished in a plain wooden building which stood on the site on which the cotton factory of A. Prall & Co. was afterward built, and, the reservoir yet being incomplete, it was run by ox-power, on which account it was known as the "Bull Mill," also the "Bull-house." The reservoir was completed and the first out-and-out cotton factory started the next year, 1794, in the early Spring. A description of this first real factory in Paterson and its equipment may not be uninteresting. The main building for spinning and weaving was of stone, 90x40 feet, four stories in height. The bleach and print works, completed later, were situated at or near the site of the old "Benson Mill," on Bridge street. Adjoining these was an extensive green. Bleaching by chemical process was at first unknown, but soon afterward, according to the minutes of the Society's transactions, the Superintendent was authorized to employ "one Tesserandot," who had made some discovery in this direction. The bleach house was of frame, 78 feet long and three stories high. The main factory, on the race, was fitted up with four carders, four roving billies, four stubbing machines, twenty-five spinning jennies and sixty single looms. The whole number of employes engaged after the works were in full operation was about 125. To procure a supply of mechanics one of the officers was compelled to visit Europe, while the workhouses of New York city had to be searched to supply operatives for the cotton mill. *Tantæ molis erat*, etc.

It has been deemed well to thus enter into the details respecting this factory, as being the first of the kind West of the Hudson, and the second on the Continent ; as well as in justice to the memories of many connected with the enterprise. Some of these have left an abiding record on the pages of their country's history, and all

deserve to be gratefully remembered by posterity. As manufacturers they failed. Means, public spirit, and determination—"the will to do, the soul to dare"—were theirs; but lacking the practical part, and being unsustained by their country, through its supreme legislature, they were doomed to disappointment, though not until they had laid the foundation of a work which has already more than realized their expectations.

It should be remembered that the early projectors of domestic industries were groping along a hitherto untrodden way, with very little to guide and much calculated to mislead them. A hundred years ago the manufacture of yarn in this country had advanced but little beyond the use of the spindle and whorl, and the manufacture of cloth was conducted on looms but little better than the "Primitive Loom from Midcaldor." Even up to the beginning of the present century a few small cotton mills in Rhode Island and the attempt made in Paterson, together with the weaving of coarse cloths of cotton, wool and flax in private families, constituted all there was to represent domestic textile industry. The experience of the Revolutionary war had, indeed, taught the people that the strength of a nation, in peace and in war, depends largely on the development of all branches of industry necessary to feed and clothe and shelter its people. Washington would have given half his estate at Mt. Vernon for a good cloth mill to clothe his soldiers, while he was forced to call upon the looms of France and the household looms of his own country. Even Jefferson, much as he valued the soil and the robust virtues of rural life, was compelled to recognize the necessity of applying "a portion of our industry and capital to internal manufactures and improvements." And Madison congratulated his country, early in his administration, on the "highly interesting extension of useful manufactures." Necessity, as well as enterprise and ambition, forced the people to turn their attention away from the land and the sea alone to the inventions of Arkwright and Crompton and Cartwright, and the business of utilizing the water-power of the country for the working of loom and spindle.

Adversity came to the Society for Establishing Useful Manufactures very early in its career. Even before the first cotton factory was completed the extravagant expenditure of the Society's funds had made itself painfully felt, and numerous were the shifts resorted to for the purpose of replenishing the treasury. Some stockholders refused to pay up their instalments, and an amendment to the charter had to be obtained, compelling them to do so. Complaints were made that an influential officer intrusted with large sums of money had furnished no account of the same. Large appropriations had been made to build houses for workmen and lay out the town. Under these circumstances the Directors decided to make use of their lottery privileges, and arrangements were made to dispose of tickets for \$40,000. After an abortive attempt the scheme was reduced to one-sixth of this amount. Among those whose names were mentioned as commissioners in the lottery is found that of Governor Howell, then in office.

Although the cotton manufacture had from the first been considered the Society's primal and grand object, its attention was at various times directed to other branches of industry. By looking over the minutes of its meeting in January, 1792, it is found that the Governor was instructed to treat with "one Hancart, who

has a very superior knowledge of the manufacture of tobacco, for his services." This project, however, was subsequently abandoned, whether because it could not be ranked among the "useful" species is not quite clear, and the production of the world-subduing weed was not fully entered upon at that time. In 1793, at a meeting held in February of that year, it was resolved "to build an inn or hotel at once."

The culture of mulberry trees was authorized by the Board of Directors of the Society April 15th, 1794. About the same date Mr. Colt laid before the Board a letter from the village schoolmaster asking that he might have his rent free, which was granted. Within the first few years after the Society began its operations a number of enterprises received the attention of the Board, most of which were carried out by individuals. George Parkinson was engaged to construct machines for spinning flax, hemp and wool. Outsiders also began to avail themselves of the abundant water power, and several applications were made for mill sites or rooms with power. John Campbell commenced the weaving of stockings and John Richards that of different fabrics of cotton goods on hand-loom. Thomas Marshall spun candle-wick and ginned cotton in partnership with the Society. But meantime the Society's affairs were approaching a crisis. Besides the heavy losses already noted and a general lack of encouragement, war was raging in Europe, affording merchants a lucrative business as carriers, and capital was embarked in this direction rather than in manufacturing. The expense of transportation was tremendous, the workmen unacquainted with their duties, disorderly and wasteful. In the Fall of 1795 the calico printing was discontinued, and at a meeting held January 26th, 1796, a resolution was passed to the effect that, as it was found impossible to continue further operations without loss, the Superintendent be directed to put a stop to all manufacture as soon as the goods in hand were completed, and discharge all help. Soon after the buildings were closed, and a person hired at \$400 per annum and house rent free to take a general oversight of the Society's property until it could be disposed of. Although all operations were suspended the Society did not become bankrupt, nor did it dissolve, though proposals to that effect were made. It simply lay dormant for a time, after which it recovered and has continued, with varying fortunes, to the present day. In a short time after the final suspension the population of Paterson was reduced from about 500 to 43 persons. Everything was closed up by March 7th, 1797, and Mr. Colt then asked to be dismissed, as he could be of no further use. He was accordingly released with a vote of thanks by the Board, declaring that their failure "arose from causes not in his power, nor that of any other man to prevent." His industry, prudence, etc., were highly commended. Mr. Colt then removed to Northern New York, where he resided for about seventeen years, or until about 1814, when he returned once more to Paterson, remaining until his death, in 1824, ten years later.

The Society remained in a state of collapse, following the suspension of operations in 1797, for the space of about seven years, during which time very little was done at the factory though it was offered for sale or lease. A part of it was rented to John Park, known also as Judge Park, a man of no ordinary ability, as early as 1800, and occupied by him in spinning candle wick. He was succeeded by John

Clark, the first machinist of whom there is any record as plying his trade in Paterson, who occupied the mill until it was burned in 1807, after which it was never rebuilt. All that remained to the Society at the time of the burning of its mill was the sum of \$6,000, received for insurance, and for several years the Directors seem to have held but few meetings. They lived far apart and were utterly discouraged, believing that all was lost save their honor. Judge Boudinot continued to act as Governor, and the local affairs of the Society were managed by agents. In accordance with a resolution adopted at a meeting of the Society as early as 1802, to lease as many mill sites as possible, a lease was made out to Kinsey, Crane & Fairchild, paper manufacturers, for a part of the premises afterward occupied by the well-known Essex Mill, on the present middle race. This mill, quite recently rebuilt by its present owners, R. & H. Adams, was probably, until its rebuilding, the oldest mill in the State, having been completed and opened for manufacturing in 1804.



CHAPTER X.

SECOND INDUSTRIAL EPOCH.

THE mill of Kinsey, Crane & Fairchild, to which brief reference is made at the close of the preceding chapter, was not only famous as being for a long time the oldest in the State, having stood in an almost unchanged condition for three-quarters of a century, but also from the fact that in this mill for the first time in this country paper was made in one continuous sheet, and it seems indisputable that the world is indebted to Charles Kinsey for that all-important improvement. He is represented as a practical paper-maker and a man of extraordinary talent. He caught the idea of making paper in a continuous sheet by seeing a cotton carding machine in operation transferring the thin sheets of cotton from a cylinder on to an endless web. He set to work and wrought out his idea to a practical conclusion, obtaining a patent in 1807, and putting the new method into satisfactory operation, making paper in a continuous sheet. It is true it is on record that as early as 1799 Louis Robet, of Essonne, France, contrived a machine to make paper "of a large size by a continuous motion," and obtained a patent for it in Europe. But it is also true that when this was taken to England for the purpose of being improved it was regarded and described as "only the germ of a valuable improvement in paper-making." A Mr. Gamble took hold of it in England and made several improvements on which he secured patents. After spending much time and all his money he sold out his interest with patent and improvements to H. & F. Fourdrinier, an opulent and very public-spirited firm. The Fourdriniers expended so much in maturing the improvements that they, also, became bankrupt, and there was no machinery of the kind actually brought out until about 1815, when it was produced in France by one McCalla. The improvement was never made public in England until a specification of the English patent was published in September, 1808, several years after Kinsey had invented the machine, and after he had actually obtained his patent. It is clear, not only that he was the original inventor, but that practical success had not attended any of the inventions in Europe until long after his specification had been on file in the patent office in this country. Further evidence of this invention of Mr. Kinsey may be found on the files of the Circuit Court of the United States for the first Circuit in Boston, in a case tried there forty years ago or more, in which case Mr. Aimes had prosecuted for an in-

fringement of a patent which he had obtained for an improvement in paper-making in 1822, immediately after the expiration of the Kinsey patent.

Unfortunately for Mr. Kinsey the rage for cotton-spinning prevailing at the time when he brought out his valuable invention and the prospect of a golden harvest from that line of manufacturing induced his partners, who were the capitalists of the firm, to insist upon converting the mill into a cotton factory. And this was done, despite the earnest protest of Mr. Kinsey. He was thereby deprived, in a great measure, of the honor of being the inventor of that most important improvement, to which he seems to have been justly entitled.

The declaration of war against England in 1812 gave an astonishing impetus to manufacturing enterprise in Paterson. All the owners of existing cotton and machine factories found that orders came pouring in far beyond their capacity to produce. Remunerative prices prevailed, and there was what in these days would be called a veritable "boom." Meantime the village increased rapidly in extent, population and importance, so that in a short time, according to the census given by Rev. Samuel Fisher, D. D., the famous statistician of the period, there was as large a population as could be crowded into the seventy-four dwelling houses, probably about 1,500 in number. There were at the date of this census, about 1814, included among the industries one card and wire factory, one rolling mill, one saw mill, and eleven cotton mills, all in full and profitable operation. Rarely, if ever, did a village expand so rapidly from a state of complete torpor to a condition of almost unexampled thrift.

Among the enterprises undertaken during this period the following may be noted: A rolling mill and nail factory, established in 1811 by Samuel Colt & Co., on the site where the Gun Mill was afterward built. Here the rolling of hoop and sheet iron, boiler plate and sheathing copper was carried on. In the nail factory nails were cut by machinery and headed by hand for a time; later the whole process was done by machinery. About seventy hands were employed and the product was about seven tons weekly. This continued in operation until 1826. Also a wire factory started in 1812 by Oshea Wilder, where the wire for the cotton and wool cards was made, young people being employed to set the teeth at their homes. Afterward Whittemore's invention was introduced and the primitive method abolished. The original wire factory closed in 1815. In 1811 Captain Richard Ward and Robert King formed a copartnership and built what was afterward known as the Nightingale or "Henry Clay" Mill, where they manufactured kerseys to clothe the troops with. This enterprise went to the wall in 1816, and years afterward the factory was purchased and occupied by the late James Nightingale as a cotton mill; still later by Dr. Nightingale in making yarns, etc. Cotton factories were put in operation during this period, as follows: Pratt's mill, afterward the Franklin Bleach Works; Ward & Johnson's, afterward known as the Oakman Mill; Henry Morris', late the Hamilton Mill, burned and rebuilt within a few years; Robert Collett', afterward incorporated as a portion of Danforth, Cooke & Co's. Works.

In 1814 John Colt, the pioneer in this branch of manufacture as well as in that of cotton duck, began in Passaic Mill No. 1 the manufacture of yarns and twines from American-grown flax. Most of the establishments above named were fairly pros-

perous for the space of about three years, when there was a general failure, the cause being the peace of 1815 and the consequent influx of foreign fabrics.

All of a sudden the busy scene changed, and the place that had so unexpectedly emerged from stagnation was as unexpectedly and suddenly plunged again into its former state of quiescence. The peace of 1815 proved disastrous to the interests of the growing community, the incoming of European goods stopping almost entirely manufacturing operations, ruining the proprietors and scattering the crowded population over the country to obtain a living as they were best able. These were dark days indeed—perhaps the gloomiest time that Paterson has ever experienced. It is on record that one might at that time walk from what was then Congress, now Market street, down to the river in the middle of the day without meeting a single human being. Of all the establishments started up about 1812 and the two years following the only ones which continued in operation during the period of depression that came after were those of George Holsman, afterward Todd & Raftery's, and Henry Morris, afterward the Hamilton Mill. Henry Morris was a son of Robert Morris, the eminent Revolutionary patriot and financier. The markets of the country were perfectly deluged with foreign fabrics of all kinds, the accumulation of years, and which were transported from Europe for the express purpose, it was held, of ruining our domestic industries. The attempt was only too successful. Mills were locked up, deserted and stood in gloomy solitude; the spindle rusted in the socket; the wheel rotted in its pit; the spider wove his cobwebs upon looms whose clatter had but a short time before half drowned the blithesome song of the happy, cheerful operative; the grass literally grew rank and luxuriant in many of the streets of Paterson.

The recovery from this prostration was tedious, accelerated though it was by the tariff of 1816, which gave new hopes to the enterprising people, who again returned to their places in the long-deserted mills. For this tariff the country was indebted largely to the exertions of Francis Cabot Lowell, of Massachusetts, whose services should long ere this time have been commemorated by the people of Paterson by at least the naming after him of one of its numerous streets or avenues. In time the spindle and the shuttle began again to move and operatives once more assembled.

It is a somewhat curious and noteworthy fact that Paterson has suffered from five almost complete prostrations of business, each about twenty years apart: in 1796, 1816, 1837, 1857 and 1874. This is certainly very remarkable, that these epochs of stagnation should come at such almost regular intervals; it seems as if the industrial system of the country is subject to periodic reactions, or needs occasional breathing spells, when, as it were, the giant Progress pauses in his impetuous career, halts for awhile to repose his wearied limbs, and then, as if refreshed with slumber, awakes to pursue with redoubled strength his mighty onward march. After each of these periods of depression, except, perhaps, the last, the recovery was more rapid than in the last preceding instance, in about the same proportion as the population had increased and capital, that energizer of labor, had accumulated. It would be folly to expect exemption from these visitations in the future, perhaps they should be looked for at something like corresponding intervals, but it may be

reasonably hoped that more effectual preparations will have been made to meet the enemy, and that he may be foiled with less effort and sacrifice than in the former years. One fact in this connection should never be lost sight of, and that is that every time the protection of an adequate tariff has been removed a death blow has been struck at Paterson's manufactures and the city has seriously retrograded.

Succeeding the period of depression that followed the peace of 1815 the prosperity of Paterson increased apace, the cotton, flax and iron, also miscellaneous industries flourished and new establishments were springing up on all sides. At this point of expansion, beyond which mills, shops and factories soon became far too numerous and their operations too important to warrant the varied industries being dealt with *en masse*, as hitherto, it is most fitting to divide the subject into its several proper departments, that each may be taken up in turn, thus avoiding the confusion that must inevitably result were a different course pursued.



CHAPTER XI.

THE COLT FAMILY.

BEFORE proceeding further with the thread of industrial history proper, it may be warrantable to turn aside for a brief space and furnish a digressive chapter, the subject being one of the first families of Paterson, and of the country as well. This work would be most incomplete without such a chapter, and there is probably no more fitting place for it than just here, no more suitable connection than the foregoing, nor a better time to pause for the purpose than at a point beyond which the rapid and continuous industrial expansion leads still further afield.

The Colt family have from a very early date maintained a conspicuous place among those whose enterprise and energy have built up Paterson and prepared the way for her present most gratifying prosperity, while men of the same stock have made the name renowned elsewhere, mainly, but not exclusively, in a similar connection.

Peter Colt, the first efficient Superintendent of the Society for Establishing Useful Manufactures; John Colt, a son of Peter, who was the first in this country to weave cotton duck on a power loom; Roswell L. Colt, another son, who for many years *was*, virtually, the Society, having absorbed its depreciated stock and by his remarkable ability and energy infused life and vigor into the paralyzed corporation; Col. Samuel Colt, whose now world-famous firearm was first manufactured in Paterson, at the old Gun Mill; Morgan G. Colt, son of Roswell L., who succeeded his father as Governor; Christopher Colt, the very first to introduce silk machinery into Paterson; Miss Sarah Colt, a sister of Peter, who will ever be remembered as the founder, as early as 1794, at the instance of her brother, of the first Sunday-school in the State—all these names have become as familiar as household words. A history of Paterson, industrial or general, would be of little value without a frequent recurrence to this, that may most literally be termed among the “first families”—first in many respects, but most especially so in regard to Paterson’s industrial progress.

An examination of the minutes of the Society’s meetings shows that in April, 1814, a meeting was held in Jersey City, at which the tone was one of great despondency. It was reported that several of the Directors had died since the last pre-

ceding meeting—meetings were held very infrequently at this date—and others wished to resign. The affairs of the Society were hopelessly involved and the stock depreciated until it represented very little value. A committee had been appointed long before and authorized to let as many mill sites as possible, and on the best terms. This had been done, as indicated in a former chapter, where the names of the principal lessees appear. There was a proposition at this meeting looking toward a dissolution of the Society, as there had been at several periods prior to this date. It was, however, deemed inexpedient to take this step, “at present.” Instead of dissolving it was resolved to reorganize and make another effort, using “all feasible means to renew the manufacturing of useful goods; to sell mill sites, lots, etc., and inaugurate a new era of aggressive operations.” This was done. There were represented at the meeting the interests of Peter Colt, Roswell L. Colt, John Colt, Samuel Colt, Robert Colt (by father and guardian), John O. Colt (by same), Henry Morris, Robert and John Oliver, of Baltimore, and James Craig—the latter all by proxy, John Colt. The above, all belonging to or connected with the Colt family, represented 1,991 shares of the 2,620 total, and of these Roswell L. Colt held the greater part, they having been concentrated cheaply in his hands.*

The result was the election of Roswell L. Colt as Governor and his brother John as Superintendent of the works, or Deputy-Governor. Both possessed in an eminent degree the disposition to undertake great enterprises, together with the judgment and knowledge of details required to carry them into successful execution, added to which was the hearty goodwill of their fellow citizens generally. From that period the Society flourished to a greater or lesser extent, affected of course, adversely or otherwise, by passing events and the condition of the country, even to the present day.

The Society as it now exists is what may be termed a “close corporation,” the shares being owned exclusively by members (either by birth or intermarriage) of the Colt family. A number of shares have been lost entirely, it is believed, not having been represented at the stated meetings for a generation or two past. Morgan G. Colt and Mrs. DeGrasse B. Fowler, son and daughter respectively of the late Roswell L. Colt, are at present the chief, almost the sole, owners of all the stock extant.

When the Society was organized, William Duer was elected first Governor and Archibald Mercer Deputy, as before stated. At the next election, in 1794, Nicholas Low was chosen Governor and Elisha Boudinot Deputy. In 1797 Elisha Boudinot was elected Governor and served for the space of about seventeen years, or until the organization of 1814, when Roswell L. Colt assumed the control. The latter remained Governor until a few years before his death, in 1856, when his son, Morgan G., succeeded, holding the office until 1869. Next came DeGrasse B. Fowler, the son-in-law of Roswell L., who retained the office until 1877, when he was succeeded by E. Boudinot Colt, of another branch of the family, being a son of John Colt

* The date of such concentration has usually been given as 1814, but the late John Colt, brother to Roswell L., has left a memorandum to the following effect: “R. L. C. began to purchase shares as early as 1808. I know he owned a large majority of the stock in 1809.” This memorandum is found on the margin of a page of Dudley’s pamphlet on the “Trade, Growth and Manufacture of Cotton,” published in 1853, on which page the statement is made that the stock was purchased in 1814.

and cousin to Morgan G. Colt. E. Boudinot Colt is still Governor, with H. V. Butler, President of the Ivanhoe Manufacturing Company, a nephew, as Deputy. Richard Rossiter is the very efficient Secretary and Agent. There is no record showing that the venerable Peter Colt entered actively into the Society's business upon his return to Paterson, in 1814, though it is probable, with his energetic disposition, that he did so during the period that elapsed before his death in 1824.

Very few, comparatively, who daily look upon that most unattractive building, the City Hall of Paterson, know its history or whereof it is composed. It is, in a sense, an historic structure. It will be remembered that the first cotton mill, finished and occupied in 1794, was burned in 1807 and never after rebuilt. Somewhere about 1814, when the Colts returned to Paterson, the brown stone walls of the burned mill were taken down, and the uninjured material used in the construction of a substantial residence on the site of the City Hall (the present building being identical except that it has been raised and altered somewhat), where lived successively Peter Colt, John Colt, his son, and the son-in-law of the latter, the late Aaron S. Pennington, a brother to ex-Governor Pennington; hence the name of the "old Pennington house," by which it is most familiar to some of the older residents.

The site on which Paterson is mainly built consisted originally of a succession of hills, mostly with underlying sand or gravel, which as the place has grown have been cut down to fill up intervening depressions or enter into the buildings erected. This old-time mansion stood on such an eminence, with a beautiful sloping green lawn, extending all the way to Main Street in front, and to a considerable distance on each side. The process of cutting through for streets, leveling and converting into building sites has been going on for many years, until the whole appearance of this portion of the city and further Eastward has been changed almost beyond recognition. John Colt, of whose manufacturing operations there is much to be found elsewhere in this work, built and resided in the elegant residence at the corner of Market and Colt streets, now the "Hamilton House." This was sold about thirteen years ago to the late George Oates, and Mr. Colt removed to Seabright, where he died a few years since. He is still remembered by most of the Paterson people as a fine type of the patriarchal old gentleman, with beautiful long silvery hair, like spun glass; a figure to attract a second glance on the streets of any city and to inspire respect in any circle. After his removal to Seabright he used occasionally to visit Paterson, where so many of his busiest days had been spent and his best energies exerted. No single member of the Colt family has left his impress on the history of Paterson to the same degree as Roswell L. Colt, who came to the city in the strength of his manhood, aged twenty-eight years, and was thenceforward identified with its progress for the space of about forty-two years; that is to say from 1814, when he assumed control of the business of the Society as Governor, to 1856, when he died, at the age of about seventy years. He was a man of eminent ability, and was noted equally for his excellent business qualifications and his high culture. He was probably the greatest Colt, taken for all in all, of any who have been known in Paterson. He married a Miss Oliver, of Baltimore, an accomplished lady of high family. At first after his marriage, which occurred about the time of his ab-

sorption of the Society's stock, he resided mainly in Baltimore, but later removed to New York and lived in Park Row. He made frequent visits to Paterson during this period. Some time subsequent to 1830 Roswell L. Colt built the imposing residence in Paterson on what is now well known as "Colt's Hill." This eminence was originally as unsightly and barren as any place could well be. There was positively no vegetation, scarcely a blade of grass. It was simply an unpromising sand-hill. Mr. Colt took hold of the tract, originally much larger than at this date, and planted trees, and cultivated the ground until the desert was made to blossom as the rose, and the dreary-looking hill was changed into the beautiful forest in the heart of the city, as seen by the present generation.

One of the most commanding objects in Paterson is the "Roswell House," its old-time appellation, with the adjoining grounds on Colt's Hill, which latter, once rivaling the lordly parks of England in extent and beauty, are now sadly curtailed, the hungry jaws of Improvement having bitten off huge slices year by year. Until recently, when with the growth of the population it became impossible to guard the grounds from the intrusion of lawless characters, this superb demense, with its graceful walks and drives, its graperies, arbors, conservatories and parterres, its statuary, among which were the "Tam O' Shanter" and "Souter Johnny" of Thom, made from the beautiful brown stone of the Little Falls quarry, was constantly open to the public, constituting the only "park," save the grounds about the Falls, the Paterson people have ever had.

The fine old mansion is of brown stone, 66x66 feet in size, four stories in height. Through the centre runs a wide hall, where a coach-and-four could be driven with little difficulty. The substantial walls about the grounds were built by Samuel Pope about a half-century ago. At this elegant home, where for many years culture and refinement reigned and all conceivable luxuries were found, including also the choicest works of art, some of the greatest men this country has ever known were wont to be received as guests. Daniel Webster and many of his contemporaries were frequent visitors; also the editors of the leading newspapers of New York and other cities, authors and men of letters in all departments, literature, science and art being alike represented. A princely hospitality was extended to all, and even casual visitors of note to the grand natural curiosity of the section, the Passaic Falls, were often agreeably surprised by the reception of a present of the choice grapes grown on the Hill, or an invitation to partake of the hospitality of the courtly and refined occupants. The premises, occupied up to the beginning of 1881 by the families of Messrs. Morgan G. Colt and De Grasse B. Fowler, the son and son-in-law respectively of the founder, Roswell L. Colt, was uninhabited at the close of that year, with a prospect that the magnificent property would be thrown into the market.

CHAPTER XII.

KING COTTON'S INAUGURAL.



ETAMORPHOSING a quotation used by Newman Hall in his "Land of the Forum and the Vatican," it may be said: In its natal dwelling-place, amidst the busy hum of kindred activities, there lies in comparative dormancy an industry whose life is only, or mainly, in the past; it may be, also, in the future. This is the cotton manufacture of Paterson. The record of its past is a brilliantly creditable page, and the operations of its busiest days are still remembered by many of the older residents of the city.

Born in auspicious days, when the budding resources of the young Republic gave promise of richest fruits, and cradled where generous Nature gave most abundant store of power, this industry seemed one whose wheels were never meant to tire or stop while cotton grew.

Until the erection of the first cotton mill in this country, at Beverly, R. I., in 1787, cotton fabrics had been supplied to consumers here from India, and more recently from England, where, about the breaking out of the Revolutionary war, most ingenious and effective inventions had given this industry a new and extraordinary stimulus. Even in England, until the decade from 1780 to 1790, which saw the full development of Hargreaves' and Arkwright's inventions, it was thought necessary to use a warp of linen, using cotton simply for the weft of the cloth. This was done for two reasons: that the fibre of flax was so much longer and capable of a greater tenuity, enabling it to be spun more successfully on the crude machinery of that day; and also because the raw material of the former was much the cheapest. All the cotton and linen fabrics, also the cloth of cotton and linen combined, first in use in this country, was home-spun and woven, the wheel and hand-loom being found in every considerable household.

The enterprise at Beverly proved a failure. The power was supplied by two bay horses driven by a small boy. The raw cotton was obtained from the West Indies in exchange for fish, one of the great staples of the State.

November 17th, 1789, Samuel Slater, an Englishman, born in Derbyshire in 1768, and who had served a full apprenticeship with Jedediah Strutt, a partner of Sir Richard Arkwright, in cotton-spinning, landed in New York with Arkwright's spinning-frame in his brain, the British Government having prevented a model of

it from being stowed in his trunk. He was of remarkably retentive memory and had made himself absolute master of the industry in all its details. In the following year he was engaged to construct and superintend the Arkwright machines at Pawtucket, R. I., the first ever put into operation on this continent, the spinning at Beverly having been done by the jenny alone. The very next successful attempt at cotton-spinning by machinery in this country was made at the "Ox-mill"* in Paterson, in the Summer of 1793, as already noted, and the first cotton mill and press works West of the Hudson were those of the Society for Establishing Useful Manufactures, finished and occupied in 1794.

It is worthy of note that the three great industries, silk, cotton, and locomotive, were planted in Paterson almost as soon as introduced into the country; the first-named when as yet very little progress had been made elsewhere—none that could be regarded as really satisfactory; the cotton second in order and but three or four years after the first attempt was made at Pawtucket; the locomotive at a time when little had been done in that department beyond the limit of what may properly be termed experiment. These are very important facts. The proud distinction of having been among the first in three of the most valuable of the great arts of peace is a boast that cannot, probably, be made by the people of any other American city.

The manipulation of cotton may justly be termed the parent industry of Paterson. In the earlier period of the reign of His Royal "Fibreness" it came to pass, most naturally, that the necessities of the cotton manufacture promoted attempts, and successes, too, in the construction of machinery; and the working in iron, especially in the department of machinery, led to the building of locomotive engines, when the necessity for them arose. It is also true that years afterward, when the silk industry was brought here, an exotic and needing the utmost care to promote its growth, it was the cotton industry that furnished the skilled labor, the women and children especially, and soon the old was largely forsaken for the new, the manipulation of silk being so much more cleanly as well as more remunerative than that of cotton.

A full description of the first cotton mill and its plant has been given in a preceding chapter; also it has been stated that after a few years' occupancy it was burned, in 1807, at which date very little was being done in it. Several years passed, and still there was little movement, though two mills were erected, one each in 1808 and in 1809, until the war of 1812 gave new life to the cotton as well as to other industries. In 1814, according to Fisher's census, there were eleven cotton mills in operation, consuming 1,500,000 lbs. of cotton in the year. After about three years of successful operation the peace of 1815 came and struck Paterson industries a blow from which they did not recover until the tariff of 1816 was adopted. From that time, for many years, the cotton industry grew apace, contending, however, with periodical seasons of depression and embarrassment. According to the most reliable data there were in 1825 eighteen factories, running 24,000 spindles and using 6,000 bales of cotton yearly, besides 1,600,000 lbs. of cotton yarn, and turning out over 3,000,000 yards of cloth. In 1829 there were seventeen cotton fac-

* On the corner of Mill and Congress streets, now occupied by Abraham Godwin, in an old wooden building then called the "Bull-house."—*John Col's Memorandum*, 1853.

ories, with 32,029 spindles. Fourteen of the mills were in operation, running 28,679 spindles; 2,179,600 lbs. of raw cotton were used and 1,914,450 lbs. of yarn made per annum. Yards of cotton duck made yearly, 150,000; yards of other cotton cloths, 1,861,450; lbs. of yarn spun and not woven in Paterson, but sent to New York and Philadelphia markets, 1,192,400; power-looms running on cotton, 266; hand-looms, 195. The Phoenix Manufacturing Company, engaged in making duck, ran 1,616 spindles. The census of 1830 gives a record of seventeen mills, all in operation, with 40,000 spindles, producing 5,000,000 yards of cloth, consuming 5,500,000 lbs. of cotton, employing 2,000 males at an average wage of \$6 per week, and 3,000 females earning \$2 a week. The record for 1832 shows an increase to twenty mills, with 50,000 spindles, and consuming 5,860,272 lbs. of raw cotton per annum. Fisher's census for 1845 has a record of thirty-seven "cotton manufacturers," but gives nothing further. In 1856 Governor Philemon Dickerson, in a lecture delivered before the Paterson Educational Association, mentions but twelve cotton mills, which, together with the other industries, paper, flax, silk, etc., gave employment to 5,500 hands, apart from about 1,650 hands employed in the four locomotive shops then in existence.

None of the earlier cotton mills were more notable than that variously designated as the "Jacobs Mill," "Passaic Mill No. 1," and Colt's "Duck Mill." This famous old structure has been rendered historical through the weaving there of the first piece of cotton duck ever made on a power-loom, in this country or elsewhere. About the beginning of the present century attempts were made in Baltimore and in the Eastern States to weave cotton duck, but heavy dressing was needed in the fabrics produced. Linen duck had been made in Paterson as early as 1816; also a duck which was a combination of linen and cotton. On February 7th, 1822, the first cotton duck without any dressing (which caused it to mildew), was produced from double and twisted yarns by John Colt, in Passaic Mill No. 1, whence the name—"Duck Mill." On March 4th, 1824, Mr. Colt wove the first piece of cotton duck ever made upon a power-loom. This should properly be regarded as a new era in the cotton manufacture. Colt's cotton duck soon attained a remarkable pre-eminence, and its market became as wide as the world. The famous clipper-yacht *America*, which so handsomely showed herself more than a match for the fleet of royal yachts in England a few years later, and taught our British cousins some lessons in naval architecture (as well as in the manufacture of sail-cloth) they were not slow to profit by, bore on those vast snowy sheets of canvas she spread, and which so excited the wonder of the Britons, the brand: "COLT'S DUCK MILL." It is worth while to state in passing that the first power-loom put up in this factory was built by Thomas Rogers, the pioneer locomotive-builder of Paterson. This famous mill, the first in this department, maintained its prosperous existence for about half a century.

CHAPTER XIII.

KING COTTON REGNANT.

THE year 1840 found the cotton industry fairly active, though there was not just at that period so surprising an increase as during some preceding years. It was about this date, or a very few years later, that the zenith was reached. For the space of a quarter of a century King Cotton was proudly regnant, without a textile brother near the throne to suggest aught of disaster or future abdication. So commanding was the cotton interest of Paterson at this period that it was pronounced by a British book of reports on the subject to be "the leading manufacturing city of the Middle States, in cotton, and exceeded only by Lowell in America." These reports, published in 1840, from which are derived several important facts, further state: "Some very superior goods are manufactured and cotton machinery made at this place, in all respects equal and in some superior to anything of the kind made at Lowell." From about that period to the present the decline of this industry has been gradual, although new branches of it, such as an extensive business in the manufacture of mosquito netting, have been added. There had been, however, periods of depression at different dates since 1815, including one in 1834 and another in 1837, the former caused by a local bank failure, the latter owing to a general monetary derangement affecting the whole country. Only two cotton mills of importance, John Colt's and Robert Carrick's, held their own through the panic of 1837. As on previous like occasions, many establishments passed into other hands during the panic of that period. From 1840 to 1857 there was an epoch of fair, though not remarkable, prosperity, somewhat disturbed by the failure of the People's Bank about 1851 and a temporary reverse in 1854. The collapse of 1857 was most disastrous of all. Nearly every factory stopped and 5,000 persons were suddenly thrown out of employment. About the years 1848-9 the decline, though gradual, became quite clearly apparent. This was a few years after the silk manufacture was established, and this new and fascinating rival was doubtless already overshadowing the pioneer textile industry. According to some very reliable data, furnished by a gentleman still engaged deeply in the cotton manufacture, the number of important mills at this time was about twenty; the total number of spindles about 45,000, divided as follows: Beaver Mill, 2,792; Industry Mill, H. M. Low, 2,112; Harmony Mill, Duncan McEwen, 1,600; Phoenix Mill, 4,100;

James Nightingale's, 1,056; Stark & Co.'s, 1,056; Colt's, No. 1, 1,440; Colt's, No. 2, 2,160; Mallory's, 4,312; Gun Mill, 1,848; Essex Mill, 2,160; Daniel Thompson's, 1,200; Oakman's, rear mill, 1,920; Oakman's, front mill, 1,920; Carrick's, 3,912; Charles Danforth & Co.'s, 1,584; Munson Godwin's, 1,584; 'Thomas Rogers', afterward the Jaffray Mill, 1,848; John C. Benson's, 3,168; Bentley's (burned about this time), 1,300. It is worthy of remark that in the cotton department of R. & H. Adams' great mills there are as many spindles now running as there were in all these mills at the date in question. At the Essex Mill, owned by this firm, where there were but 2,160 spindles thirty years ago, there are now 17,000 in motion.

From Andrew Vreeland, President of the Enterprise Manufacturing Company, the only concern in Paterson engaged to any extent in cotton-spinning exclusively, have been obtained the following valuable recollections of notable cotton manufacturers who were prosecuting the business during the height of its prosperity, and who dropped out one by one as the conditions assumed a phase no longer favorable for its profitable continuance. Mr. Vreeland can remember clearly as far back as 1822-3, and forms a most important link between the past and present of the cotton industry in Paterson, as the intermediate period of nearly sixty years comprises the space wherein the most extensive operations in this department were carried on.

The old Industry Mill, Van Houten street, on the site of the present mill of that name, which is included in the vast collection of buildings of R. & H. Adams, was formerly a saw-mill, and Mr. Vreeland and others of the older citizens remember when great piles of logs were "skidded" up there, on the river bank, waiting their turn at the saw. It was changed into a cotton mill about 1830, and about that time and until 1840 it was occupied by William Ridgway and William Dickey, who were followed by Messrs. Taggart, Morris, and H. M. Low successively, after which, in 1875, it was purchased by R. & H. Adams, who tore it down and rebuilt it, after being forty-five years in occupation as a cotton mill.

The old Beaver Mill has been more numerously occupied, perhaps, than any other in Paterson, and for a greater variety of purposes. In 1809 the elder John Clark had a small machine shop on the rear of the lot; about 1816 or 1818 Clark & Rogers occupied what was then known as the "Young Beaver" Mill as a machine shop, and they were succeeded by William Parrott, who was in the same line of business; about 1822 Plunkett & Thompson, Robert Lacklison, Truelove and others occupied at least a portion of it within the few succeeding years, but the record is that in 1822 a portion of the Beaver Mill proper was occupied by William Berry, who manufactured cotton yarn there, and about 1840 Samuel G. Wheeler, a man of no inconsiderable note, came from Oldham, where he had failed in the machinery line, and occupied the whole or part as a cotton mill. He purchased and lived in the "Colt," afterward the "Pennington House," now the City Hall, for a few years, then again failed, and was succeeded in the occupancy of the mill by John C. Benson, who removed about 1850 to engage in the silk manufacture at his new mill in Bridge street. Afterward George Wylie occupied the Beaver Mill for carding rose blankets, napping canton flannel and kindred business, and it has since been occupied for silk manufacturing and other purposes.

The Harmony Mill, also a portion of R. & H. Adams' establishment, is located

next adjoining the Industry Mill, and was originally a small wooden structure, built by 'Squire Smith (some say by a Mr. Berry) some time prior to 1822. About 1830 it was occupied as a cotton factory by Warren Haight, who was succeeded by Benson & Rutan, who came to its occupancy from the Holsman Mill. Two or three years later Munn & Whitehead, who afterward were located at the Stone Mill at Midvale, occupied it for a year or two, and were followed by Duncan McEwen, from whose heirs it was bought in 1857 by the firm of William Adams & Co., afterward R. & H. Adams, the present owners.

The Phoenix Mill proper was first occupied by John Park, a cotton-spinner, but in 1817 J. Velasquez bought the leases of the property from the Paterson Bank, who held them as collateral for loans to Park, and the product was changed to linen sail canvas, sail twines, etc. Velasquez formed a partnership with John Travers in 1821, and in 1826 a charter was granted and the Phoenix Manufacturing Company was formed "for manufacturing fabrics of linen, cotton, wool and other articles." In 1854, and under the same ownership, this establishment returned to the manufacture of cotton goods, almost or quite exclusively. In 1865, when the late Benjamin B. Tilt obtained a controlling interest in the company, the product was changed to silk.

The Nightingale Mill, as it is now called, adjoining the Phoenix, was built half-size by Adrian Van Houten about 1821-2. About 1825 it was occupied by Aaron and Robert King, brothers, who were very prominent as cotton manufacturers a half century ago. Plunkett & Thompson and others afterward occupied it for various purposes, and about 1834 John Nightingale, father of James Nightingale, was located there, the business being once more cotton manufacturing. A few years since it was purchased by Joseph Nussey, who occupies it as a machine shop.

The Holsman Mill, so named from an early owner, Daniel Holsman, on the site of the works of the J. C. Todd Machine Company, is remembered by Mr. Vreeland as far back as 1822. Later Benson & Rutan (John C. Benson and John Rutan) occupied it as a cotton factory, spinning yarns on commission; later still, about 1840, Stark & Parsons succeeded to its occupancy for the same purpose; afterward it was occupied by Todd & Mackey as a machine shop, since which time no cotton has been manufactured there.

The old "Red" or Franklin Mill, on Mill street, which has been partially burned several times and rebuilt, was in 1822-3 occupied by Daniel Thompson, who manufactured cotton yarn on commission. It was wholly or in part a cotton factory for about a quarter of a century, but sheltered many other industries as well. Smiths, Whitely & Beggs started a machine shop there in 1843, the firm was changed to Swinburne, Smith & Co. in 1844, and in 1848 a new shop was built on the rear of the lot. The firm removed in 1849. The Watson Manufacturing Company started in this mill in 1851, but removed a few years later. In 1867 the Paterson Steam Fire-Engine Works commenced operations there, remaining for a year or two. In these years portions of the mill proper were occupied for other purposes at various times, and in 1868 Alexander and George McLean occupied a portion of the building as a mosquito net factory. About 1870 the mill was burned and all the occupants were sufferers, including Messrs. Harral & Hayes, builders of steam fire-engines and spinners of brass domes for locomotives, etc.

The Hope Mill has a record as a cotton factory at least as far back as 1822, when it was occupied by Mark Collett and Joseph Smith, who remained there until about 1840, and were succeeded by one Warden, a relative of the Carricks (A. & R. Carrick), among the most extensive cotton manufacturers of that day. Warden was succeeded by John Oakman, and a few years later Oakman sold the mill and disposed of the plant, which was taken to South Carolina, to equip a mill there, and John Swinburne occupied the building for several years subsequent to 1856 in the manufacture of jute yarn and cordage. Still later it has been devoted to the silk industry.

The Hamilton Mill, off Mill street, also was first occupied by Messrs. Collett & Smith, and at the same date that the firm were manufacturing at the Hope Mill. After them came William Dickey and Mark Heatcote. Mr. Dickey dying, John Mortimer succeeded to the partnership, but the firm soon separated, Heatcote going across the river and building where Pelgram & Meyer are now located. Mortimer afterward sold the plant to James R. King, who, with E. T. Prall and others, at a later date built the Arkwright Mill and subsequently removed to Georgia, the next occupants of the Hamilton Mill being the Bachmann Brothers, woolen manufacturers, who commenced operations there about 1864.

The Collett Mill, a portion of the walls of which yet remain and are incorporated in the Danforth Works, was erected by one of the Collett family some time between 1812 and 1815, and about 1822 was occupied by Godwin, Rogers & Co. (Abraham Godwin, Thomas Rogers and John Clark, Jr.), who had just formed a co-partnership for the manufacture of cotton and cotton machinery. This business was continued without change until 1831, when Mr. Rogers retired from the firm and Charles Danforth was admitted, after which the manufacture of cotton was prosecuted by the new firm and its successors until about 1871.

The Munson Godwin Mill, adjoining the machine shops of the Danforth Works, was built by the late Aaron King very early in the century, the material, trap rock, being brought by him to the place in a scow through the middle canal. It was occupied as a cotton factory for many years by the builder, by Munson Godwin, and by H. M. Low, who was there about 1850, until it came into possession of Danforth, Cooke & Co., who occupied it for a pattern and millwright shop.

Henry M. Low, John Edwards, Abram Prall and Abraham H. Godwin began the cotton manufacture at the old Gun Mill, under the firm name of H. M. Low & Co., with H. M. Low as manager, in 1842. About 1847 two of the partners, Messrs. Low and Edwards, retired, and thereafter the business was continued by the remaining partners, under the style of A. Prall & Co., without any notable change until about 1857, when the Godwin Mill was built on the ruins of the old Carrick Mill; it was occupied by the firm in 1858, the Gun Mill, so long the theatre of their operations, being vacated. The Godwin Mill, as it was named, at the corner of Market and Mill streets, was built by John T. Spear and was regarded as one of the finest factory structures of that day. After the death of Mr. Prall, about 1859, the business was continued without any change in the firm name, Mrs. Prall representing her late husband's interest, William Ridgway, Sr. assuming the management and retaining the position until his death, in 1864, about which time the firm dis-

solved. The mill was subsequently sold to Hamil & Booth, when it was re-christened the "Hamil Mill." It has since been devoted to the silk industry exclusively.

The first mill built on this site was erected by the firm of A. & R. Carrick about 1823 and occupied by the firm in the cotton manufacture in 1824, with Joseph Stark as manager. It was burned some time prior to 1857, and subsequently the property was sold to Abraham H. Godwin, who rebuilt it, as above noted. During the years of his manufacturing operations in Paterson Mr. Godwin was largely engaged in the cotton brokerage at Mobile, Ala., and was a resident of Paterson only for a few months during the Summer. It was owing to Mr. Godwin's non-residence a larger portion of the time that William Ridgway, Sr. became manager for A. Prall & Co. after Mr. Prall's death. While the business was still located at the Gun Mill Edwin T. Prall, who had charge of Danforth, Cooke & Co.'s cotton mill, was also bookkeeper for A. Prall & Co., Abram Prall being his uncle; he was also engaged in company with Mortimer Hall in manufacturing cotton on his own account, at a mill in Godwinville, five miles North of Paterson.

The old Gun Mill sheltered many diverse industries from the time of its erection by the Patent Arms Manufacturing Company in 1835-6 to the present day. In 1859, it was occupied by two separate cotton manufacturing firms, the two upper stories being leased to Andrew G. Snyder, Alexander Rae and Andrew Vreeland, who were associated under the firm name of Snyder, Rae & Co., the lower floor to Benjamin Buckley & Co. (Edward Osborn). Both firms were engaged in making cotton yarns. The last-named firm, which in 1859 ran 1,152 spindles, employed 25 hands and consumed 3,000 lbs. of cotton weekly, remained until 1873, when the plant was sold and shipped to the South, consigned to one Howell, in Georgia, but was destroyed by fire while stored in a building near its destination until the mill should be completed wherein it was to be run. The machinery was never even unboxed. It was valued at about \$25,000. The firm of Snyder, Rae & Co. remained without change until 1863, when Charles H. May succeeded Mr. Snyder, the firm being styled May, Rae & Co. until about 1878, when the Enterprise Manufacturing Company was incorporated, the members being Andrew Vreeland (President), Charles H. May and Alexander Rae. When Snyder, Rae & Co. first started they had about 1,728 spindles, employed 40 hands and consumed 4,500 lbs. of cotton per week, but very soon 2,500 spindles were in motion, and the number of hands was increased to 50. The space occupied at this date was 40x130 feet. Nothing but hank yarn was manufactured. In 1865 the firm employed about 65 hands, and the plant was greatly increased. Since 1860 the power has been furnished by steam. Two rooms are now occupied, each 40x130 feet; 6,000 lbs. of cotton are consumed weekly, from which is produced over 5,000 lbs. of two-ply warp; the fortnightly payroll averages \$600.

According to Mr. Vreeland the "Stone Mill," afterward the property of E. S. Jaffray & Co., and purchased a few years since by the Danforth Locomotive & Machine Company, was built by the late Aaron King, about 1842. The "Company" were John Ritchey, John Hinton and Charles Jacobs. This mill was run by the firm as a cotton factory, for a comparatively short time, when it was purchased by Thomas Rogers, who sold it to E. S. Jaffray & Co. Aaron King, one of the most

notable among the early cotton manufacturers, was located at different times in not less than half a dozen different mills ; perhaps in more. He had a few frames running at one time, about 1844, in the Hamilton Mill. Prior to building the "Stone Mill" he occupied for a time the Union Works, built in 1835 by Hugh Beggs, on Spruce street opposite the Ivanhoe Paper Mill, where Beggs was located after the burning of Paul & Beggs' Works, across the street. In 1840 E. Boudinot Atterbury occupied the Union Works, and he went thence to take the superintendency of Passaic Mill No. 1 for John Colt. About 1857 he built the Boudinot Mill, which he equipped with his old plant and much new machinery. The mill was run by steam, and this is said to have been the first cotton factory in Paterson, perhaps the first in the State, to use steam power, which proved a complete success. The location being "inland," distant from the raceways, at the corner of Straight and Ellison streets, water power was out of the question. About 40 operatives were employed at the Boudinot Mill in 1859, and 1,500 spindles were run on twines, yarns and twist. The weekly consumption of cotton was about 4,000 lbs. The cotton manufacture was discontinued about 1868, and the plant was sold and shipped South.

The late General Thomas D. Hoxsey occupied the Union Works at a later period than Mr. Atterbury, but abandoned cotton-spinning during the war. Henry M. Low succeeded General Hoxsey, taking his machinery, which he ran for a time ; subsequently it was sold, probably, Mr. Vreeland thinks, to equip a Southern factory.

Mr. Vreeland remembers the building of a cotton mill on the upper raceway, about 1830-31 ; size 75x36 feet, three stories, which was occupied for a time by John C. Benson before he went to the Beaver Mill. This mill was torn down to make room for the Ivanhoe Paper Mill. Rutan & Benson (John) had a mill adjoining, at about the same date, and very similar, which, also, was torn down to make way for the Ivanhoe Mill, Rutan & Benson retiring from the business.

The Mallory Mill, built by John Travers about 1842, for a woolen factory, was occupied by different tenants at various dates ; among others by Jackson & Maginnis, the product being cotton cloth—no yarns. This mill was on the site now occupied by the Franklin Manufacturing Company's. The old structure was burned down.

The foregoing are, as already intimated, mainly the recollections of Andrew Vreeland, one of the veteran cotton manufacturers of the past and still actively engaged in the industry. Being recollections merely, they are not infallible, but, inasmuch as the history of the cotton industry of Paterson is largely fragmentary and the material consists almost entirely of reminiscences, it must be conceded that Mr. Vreeland has furnished a valuable contribution thereto. Mr. Vreeland's memory concerning the extensive operations carried on in the cotton manufacture at Passaic Mill No. 1, Passaic Mill No. 2 and the Essex Mill by the late John Colt and his successors, the Paterson Manufacturing Company and, later, the Passaic Manufacturing Company, is very clear, and his account circumstantial ; but, inasmuch as the writer has been furnished the principal data regarding these important operations by a member of the Colt family, and one who was for years himself interested in the manufacture at these mills, it is deemed well to substitute this account for Mr. Vreeland's otherwise invaluable reminiscences.

In the initial chapter on the cotton industry brief reference has been made to the operations of John Colt, one of the earliest, as he was also the most eminent, among Paterson manufacturers. He began the iron and flax manufacture about 1812, in Passaic Mill No. 1, in "Boudinot," now Van Houten, street, and soon after occupied the "Old Yellow Mill," on the site of the present Essex Mill, on Mill street. At about the same date of his commencement at the first-named mill, familiarly known for half a century, and even to this day, as "Colt's Duck Mill," John Colt opened a store in New York city, at No. 9 Burling Slip, for the sale of the products of his Paterson manufactory and of general ship stores.

Both the iron and the flax industry were carried on at Passaic Mill No. 1, the former including the production of wire and the latter being at first mainly devoted to making linen and, later, to weaving cotton duck. The product of the "Yellow" or Essex Mill was from the first almost or quite exclusively yarns—warp and filling, for the New York and Philadelphia markets. Passaic Mill No. 2, on Spruce street, was built by the Society for Establishing Useful Manufactures in 1838. It was occupied by the Paterson Manufacturing Company, organized in 1828, as the successor to John Colt, and of which organization he was President and owner of a larger portion of the stock, as soon as built, and in 1844 the mill was purchased by the company, making the third large mill thus owned and occupied. Passaic Mill No. 2 was at first devoted to the manufacture of sheetings, but the product was afterward changed to yarns. The original Essex Mill, as it stood prior to its reconstruction by its present owners, R. & H. Adams, a few years ago, was an historic structure, being the oldest factory in the State. It was occupied first in 1804 by Kinsey, Crane & Fairchild, paper manufacturers, whose operations are described in another department of this work.

Within a few years after the commencement of business by John Colt at Passaic Mill No. 1 and the Essex Mill, Daniel Ridgway, the progenitor of a family of eminent cotton manufacturers, was employed by Mr. Colt as manager or superintendent, and continued in this position until his death, late in 1857. Upon the death of Daniel Ridgway, his son, William Ridgway, Sr., who had been employed in the establishment in a position subordinate to that of his father, a portion of the time as bookkeeper for John Colt, and as Secretary of the Paterson Manufacturing Company after its formation, succeeded to the management and was still continued as Secretary.

The Paterson Manufacturing Company was continued under the presidency of Mr. Colt until about 1857, when William Ridgway, Sr., became President and retained the position for a comparatively short period, during which the affairs of the company were being settled up, when E. Boudinot Colt, a son of John Colt, purchased the stock and the Passaic Manufacturing Company was formed, with E. B. Colt as President and William Ridgway, Jr., a son of the elder William Ridgway, as Secretary.

The business was prosecuted with a fair measure of success by the new company until 1869, when they suspended operations and the property was sold; the Essex Mill to William Adams & Co., predecessor to R. & H. Adams, and Passaic No. 1 to the Franklin Manufacturing Company. Passaic Mill No. 2 had been sold

previously, about 1864, to Barbour Brothers, flax-spinners, who still retain it in possession. Prior to the dissolution of the company, however, about 1859, William Ridgway, Jr., succeeded E. B. Colt in the presidency, and William Ridgway, Sr., retired from the management that he might devote more attention to the affairs of A. Prall & Co. (Mrs. A. Prall and Abraham H. Godwin), for whom, also, he was manager.

William Ridgway, Jr., who had been ill for some time previously, died October 20th, 1869, soon after the closing up of the company's business.

A series of excellent articles on the industries of Paterson, from the pen of William Wright, at one time editor of the *Paterson Press*, were published in the *Scientific American* in 1859, and from these some very important data have been gleaned for this work. Mr. Wright corroborates Mr. Vreeland in many particulars, as may be seen by the following summary of his account of the cotton industry up to the date above mentioned :

"During the war of 1812 the Essex Mill was converted into a cotton factory, in which condition it has since continued. In 1856 it was enlarged by its late proprietor, John Colt, and now contains 4,000 spindles, employs 90 operatives and consumes 10,500 lbs. of raw cotton per week. The product (yarns) is sent to the Philadelphia market. Griffith King is Superintendent.

"In 1811 Captain Ward, with Robert King as partner, built what is now known as the Nightingale or Henry Clay Mill, where the firm carried on spinning and the manufacturing of kerseys to clothe the Government troops with until the prostration of 1815. Twelve years afterward it was purchased by the late James Nightingale, who enlarged it and ran it as a cotton mill for many years. Part of it is still occupied by Dr. Nightingale, who employs 25 hands in making yarns, running 1,150 spindles and using 3,200 lbs. of cotton per week.

"During the period between 1812 and 1815 the following cotton factories went into operation: Pratt's Mill, now the Franklin Bleach Works; Ward & Johnson's, now the Oakman Mill; Henry Morris', now the Hamilton Mill; Robert Collett's Mill, now Danforth, Cooke & Co.'s; A. & R. King's, now on the same premises; D. Holsman's, now Todd & Rafferty's. The Beaver Mill had been manufacturing cotton since 1809. Considerable hand-loom weaving was carried on in private dwellings. The brothers King, who are now nearly the oldest inhabitants of the place, were the first to introduce power-looms, which they themselves made after a pattern obtained from Scotland. During the collapse of 1816 but two establishments, those of Messrs. Holsman and Morris, continued in operation.

"Colt's Passaic Mill No. 1 has doubled its former capacity and now contains 2,250 spindles and 50 power-looms, and gives employment to 120 operatives. The quantity of cotton consumed weekly is 10,000 lbs., and the annual product about 450,000 yards of duck. Passaic Mill No. 2, a substantial four-story stone building, contains 5,000 spindles and 65 looms, and employs 120 operatives; weekly consumption of cotton, 11,500 lbs. Part of the yarn is sent to the Duck Mill; the remainder is woven into muslins, canton flannels, etc. This establishment, together with Passaic Mill No. 1 and the Essex Mill, is now owned by E. Boudinot Colt. The whole number of employes is 330, who receive in wages about \$60,000 per annum.

"The Phoenix Mill, the largest of its kind in the State, employs 180 operatives in spinning cotton yarns and weaving duck, which has been carried on since 1830. Number of spindles, 7,000; of power-looms, 60; weekly consumption of cotton, 12,000 lbs. J. H. Sprague is President, and W. H. K. Bibby Secretary and Superintendent.

"The following comprise the statistics of the several mills in Paterson in addition to those already given :

"Industry Mill, Henry M. Low's ; number of spindles, 2,500 ; of employes, 65 ; weekly consumption of cotton, 7,000 lbs., made into yarn.

"Harmony Mill, William Adams' ; number of spindles, 2,500 ; of power-looms, 36 ; of employes, 80 ; weekly consumption of cotton, 3,000 lbs., spun and woven into mosquito nettings, crown linings, etc., and afterward bleached on the premises.

"Snyder, Rae & Co., in the Gun Mill ; number of spindles, 1,728 ; of operatives, 40 ; cotton consumed per week, 4,500 lbs.

"Osborn & Buckley, in same mill, where both commenced in 1859, run 1,152 spindles, employ 25 hands and consume 3,000 lbs. of cotton per week.

"John Oakman runs 2,700 spindles, employs 75 operatives and consumes 7,000 lbs. of cotton weekly, which is made into yarns.

"Dickey & Heathcote, in the Hamilton Mill, run 2,250 spindles and employ 40 hands ; cotton consumed weekly, about 6,000 lbs.

"A. Prall & Co., 5,352 spindles and 58 cards, consuming weekly 14,000 lbs of cotton, spun into yarns. About 85 hands are employed under the superintendence of William Ridgway. This establishment was built on the site of the old Carrick Mill, and went into operation in the early part of 1858. It is a massive brick building, about 75 feet long, three stories high, and fitted up in the best manner.

"Danforth, Cooke & Co. employ 65 hands and run 2,600 spindles, consuming 7,000 lbs. of cotton weekly, made into yarns. Their factory has recently undergone a considerable enlargement.

"The Jefferson Mill, owned by Jacob Rogers, contains 3,400 spindles and employs 70 hands. Weekly consumption of cotton, about 6,000 lbs. A. Polhamus is Superintendent.

"The Union Works, occupied by Thomas D. Hoxsey, contain about 3,000 spindles and consume 7,000 lbs. of cotton per week, made into twine, wicks, warps, &c. ; number of employes, 60.

"The Boudinot Mill was built in 1857 by E. B. Atterbury, its proprietor and manager. This is the only cotton factory in Paterson driven by steam power, an experiment in which Mr. Atterbury appears to have been quite successful. About 40 operatives are employed and 1,500 spindles are run, making yarn and twist ; weekly consumption of cotton, about 4,000 lbs.

"A Mr. Crabtree is also starting some machinery in an apartment of the Hamilton Mill.

"The aggregate number of cotton spindles running in Paterson may be set down at 48,000 while that of the employes reach to about 1,200. The wages paid to each of these will average \$3.50 per week, or about \$225,000 per annum in the aggregate. The quantity of cotton consumed annually approaches six million lbs., from which, if fifteen per cent. be deducted for waste, we have a total of about five million lbs. spun and a million and a half yards of duck, canton flannels, etc., woven. To attempt making an estimate of net profits would be futile, as probably no two establishments show a like result.

"Among the more prominent early manufacturers of cotton, besides those already named, may be mentioned Daniel Ridgway, Mark W. Collett, William Jacobs, Rutan & Benson, Jackson & Maginnis and Robert Carrick. Mr. Ridgway for many years carried on the business in the Industry Mill, in partnership with William Dickey, the oldest native of Paterson now living. Mr. Collett occupied what is now the Oakman Mill, and Mr. Jacobs the Jefferson Mill. Mr. Carrick was engaged from 1823 to 1848, spinning and weaving. His mill was burned down by an incendiary about 1848, when Mr. Carrick retired to private life, to the general regret and loss.

"By the introduction of the power-loom hand-loom weaving was for a long time


driven to the wall. About the year 1838, however, it was revived by John Parker, who manufactured towels, table covers, etc. Subsequently Abram Croysdale, Allen Knowles and others embarked in the same business, and at present about 60 looms are at work for some half-dozen parties in town. Among these William S. Malcolm has distinguished himself by the production of new and superior fabrics, such as woolen and cotton quilts, counterpanes, wool damask covers, hoop extension tapes, and the like. Mr. Malcolm began in 1848, and in 1853, received the only premium given at the New York World's Fair for such goods. He also received a premium at the Castle Garden Exhibition in 1854. About 25 looms are at work for Mr. Malcolm, and his fabrics command an extensive sale all over the country. George Wylie is engaged in "napping" canton flannels at the Beaver Mill, where he has 28 machines and is prepared to turn out 30,000 yards per day, his work being all done to order."

It is not probable, judging by all the foregoing, that there was any perceptible falling off in the cotton industry prior to 1860, though there were many and serious fluctuations. The number of spindles does not seem to have fallen much below 50,000, which is about the maximum number run at any time—nor was the number of mills or of employes greatly decreased until a subsequent date. It does seem, however, that every attempt at cotton-spinning inaugurated after 1860 proved more or less of a failure, while those who were already engaged therein dropped out of the business, one after another, leaving the Enterprise Manufacturing Company the sole survivor of the great establishments that were its contemporaries.



CHAPTER XIV.

KING COTTON DETHRONED.

HE term "dethroned" is used in a comparative sense only. The status of the cotton manufacture even at this date will compare favorably, in the number of spindles and looms running, number of hands employed, amount of wages paid and value of production, with that at the period of its highest prosperity; but there has not been a growth at all commensurate with that of the city, nor in proportion to that of other industries. In fact there has been no growth at all worthy of mention. As to the cause of the virtual decline a hint has already been given. A number of elements have contributed to dwarf the industry. The falling off is not from lack of power, or labor, or a market; but as certain muscles of the body are developed at the expense of others, or as the graft upon a tree in some instances becomes a sturdier, thriftier limb than that which bears the indigenous fruit, so the machinery, locomotive and iron industries, at first adjuncts of the cotton manufacture, and less precarious in their nature, and the silk business, attracted here by the abundant skilled labor the cotton mills had gathered, offering better wages than the parent industry could pay, and more profitable returns to the investor, have, step by step, so entrenched themselves that the cotton manufacture has, to a considerable extent, been uprooted in its native soil. And it cannot, on any reasonable hypothesis, be expected to regain its former large proportions, in reference to the other industries and to the growing importance of the city, save, perhaps, in the department of finer productions. If the "lost art" ever experiences a *renaissance* it will not be in the spinning of yarn and the production of the coarser fabrics, but in the making of more elaborate and costlier goods for use and adornment. A veteran cotton manufacturer recently said in reference to this: "Paterson will never again spin the yarn for others to weave; that can be done much cheaper South, whither a greater portion of the machinery has gone from the Paterson cotton mills, where labor can be had for a tithe of what it costs here, and where there is no cost for transportation of raw material." The preliminary census of the cotton industry, recently prepared by Edward Atkinson for the United States Census Bureau, giving the statistics of the past decade, shows that the comparative advancement has been much more marked in the South than in New England or any other Northern portion of the Union; while the former has doubled its number of

spindles and looms and more than doubled its product the latter has increased about one-third.

In the very excellent article on "The Cotton Industry," written by Joseph W. Congdon and published in the Centennial report of the Paterson Board of Trade in 1876, is found the following :

"The status of the cotton industry in Paterson is represented by the following statistics : Production of cotton yarn, 300,000 lbs. per year ; cotton converted into yarn, 750 bales per year ; hands employed in spinning yarn, 60 ; yearly labor pay rolls, \$30,000 ; capital employed in spinning of yarn, about \$75,000 ; number of spindles, 2,500. In the production of mosquito netting, buckram and crown linings, in which Paterson, as represented by R. & H. Adams, is a controlling power, there are employed over 400 hands, earning average wages of \$10,000 per month, operating some 400 looms with 26,000 spindles, consuming about 60 bales of cotton per week ; capital invested, about \$300,000. The manufacture of dress shirts is an important branch of the cotton interest, in which the invested capital amounts to about \$150,000. The capacity of the three factories is equal to the production of 800 dozen shirts per week, though not more than 500 dozen per week have been produced for some time past. Number of employes, over 80. Two manufacturers of shoe laces produce about 500 gross per day in busy times, using automatic machines in several processes. The production of counterpanes and spreads occupies fourteen looms in the hands of two proprietors, and two others occupy about a dozen looms in making 'Turkish' towels, tidies, dusters and hand-cloths."

Not many new attempts were made in the cotton industry subsequent to the publication of Mr. Wright's sketch in 1859. During the war, which gave an impetus to all kinds of manufactures for a time, a very few cotton-spinning enterprises were undertaken, and of these three were especially noteworthy. They were all failures, and more or less disastrous ones.

About 1865 James R. King, a relative of the somewhat famous Roswell King, of Atlanta, Georgia, induced Edwin T. Prall, of Danforth, Cooke & Co., to join with him in building a model mill and entering largely into the cotton manufacture. The firm was styled James R. King & Co., Mr. Prall having much the larger interest. While the mill was building it became apparent that Mr. King was not able to raise the necessary funds for his share of the stock, and the plan was changed, and a stock company formed April 12th, 1866. It was called the "Arkwright Manufacturing Company," and the mill then built is the structure since so well known as the Arkwright Mill, one of the finest and most substantial in the city. It was built by Colonel Andrew Derrom. The capital stock of the company, of which Mr. King was President and William M. Prall Secretary, was to be \$500,000, but a large portion was never taken, and the amount actually invested fell far short of that sum. Mr. Prall held 350 shares of the stock, James R. King 100 shares, Thomas Farnon 100, Ann Salisbury (a male) 60 shares, Charles Danforth 100 shares, William Mortimer Prall 10 shares ; there may have been a few more taken, not many. The mill, which was not at that time more than half finished, was built 50x200 feet, three stories high, with extension. The machinery was of the very best description, mainly from Danforth, Cooke & Co.'s shop. There were two boilers of great capacity and a very powerful engine, the same that was purchased and set at work by the Passaic Water Company in 1880. The product of the Arkwright Mill was

fine cotton yarns. The mill was run about three years, at a loss, when there was a collapse, most of the stockholders losing all they had invested. Edwin T. Prall is said to have lost \$86,000 by the venture. He died in 1869, about the time of the failure, after which the mill stood idle for two or three years, when it was rented to various parties, including the Barbour Brothers, H. L. Butler, Prall Brothers and Grimshaw Brothers, until, a few years ago, a heavy mortgage held by Michael Morris was foreclosed, and the mill was sold to Heintze & Co., who defaulted in the payments and the property reverted to Mr. Morris, who owns it still. Mr. King was the most fortunate of all the partners, as he exchanged his stock for the magnificent plant of the company, which he removed to Atlanta, Ga., where it is now in use in a large cotton mill.

Another, and somewhat similar, enterprise was that of the Passaic Falls Manufacturing Company. This consisted of George Christie, President; John J. Brown, Secretary and Treasurer; John Cooke, James Cooke and George Rippey. The company was organized about 1865. The capital stock was \$50,000, Mr. Christie owning nearly half. The entire capital was invested in the very best machinery, built at the Danforth Works, and in raw material, the company owning no real estate, the East wing of the Phoenix Mill being leased and occupied. Perhaps the quality of the product, fine yarns, was equal to anything ever made in this country, but they were made at a loss. The company continued for four or five years, when the plant was removed South, to Flat Rock, about twelve miles from Atlanta, whither Messrs. Christie and Rippey accompanied it. Here a frame mill was built and operations resumed. Later the Northern owners sold their interest to one Clark and other Southerners, and thus ended all connection of Northerners with this enterprise, most of the investors losing quite heavily.

Some time prior to 1866 Samuel Smith, Jacob S. Rogers, Aaron Polhamus, Abram Collier and D. B. Grant formed a copartnership for the purpose of manufacturing cotton, the firm being styled "Smith, Polhamus & Co." The factory, known as the Empire Mill, on Green street, between Jackson and Spring streets, was built, 125x50 feet, two stories, of brick, for occupancy in the prosecution of the business. In 1866 "The Phoenix Locomotive and Manufacturing Company" was incorporated under a charter which had been obtained March 29th, 1864. April 9th, 1867, the name was changed to "The Empire Manufacturing Company," of which Samuel Smith was President, Jacob S. Rogers Secretary and Aaron Polhamus Superintendent. Mr. Smith held much the greater portion of the stock, which was divided into 2,000 shares of \$50 each. Mr. Smith held 1,000 shares, Mr. Rogers 550, Mr. Collier 250, Mr. Polhamus 200. When the charter for the Phoenix Company was obtained the intention was to build locomotives, together with the prosecution of other branches of manufacture, but this was never undertaken. Cotton spinning was carried on at the Empire Mill after the formation of the Empire Company for the space of five years, or until 1872, at first at a profit, later at neither profit nor loss, and, finally, at a serious loss. Mr. Smith during this time absorbed Mr. Grant's stock, and later took Mr. Collier's also. Mr. Polhamus' stock was given him at the start to secure his services, he being a veteran manufacturer; it cost him nothing and he got nothing for it.

About 1873 Mr. Smith became embarrassed financially through a default of the New York and Oswego Midland Railway Company to pay him for coal furnished. A judgment for \$8,000 was obtained against him by the Second National Bank of this city some time afterward and under it the Empire Manufacturing Company was about to be wiped out when Mr. Rogers took Mr. Smith's stock, paid the claim and holds a controlling power ; in fact he is virtual owner of the entire assets, real estate, machinery, etc., since about 1878. Mr. Smith lost about \$60,000 by this cotton enterprise. None of the other partners lost anything of consequence.

The mill has been rented for various purposes for a year or two past, after standing idle a long time ; a portion of the cotton machinery was sold to equip a Southern mill, and a part of it is stored in a barn on the Colt's Hill property.

There were a few other, minor, attempts at a revival of the cotton-spinning besides those above described during the years that followed the breaking out of the war of the Rebellion. None of them were in any degree successful, and they were, in the main, very short-lived. King Cotton had been dethroned ; the sceptre so long and graciously swayed by His Royal Fibreness had departed, probably forever.



CHAPTER XV.

PRESENT STATUS OF THE COTTON INDUSTRY.

BESIDES the firm of R. & H. Adams and the Enterprise Manufacturing Company, fully described elsewhere, there are a few others who may be classed among the cotton manufacturers of the present day.

Among these is the firm of S. Holt & Sons, the senior partner of which started in 1872, at the Franklin Mill, what was at the time a new industry to Paterson, the manufacture of "Turkish" towels, tidies, etc. Mr. Holt remained at the Franklin Mill one year, employing about twelve hands, and running six looms. He then removed to his present location, No 103 Straight street, where, his sons having been admitted to a partnership, the firm occupied a roomy factory, 52x32 feet, three stories. Here are all the means and appliances, including fourteen looms and the very latest improved machinery, much of it imported, for carrying on the unique manufacture, which must almost be classed among the arts. Thirty hands are employed and over \$400 paid fortnightly in wages; the production is from fifty to sixty dozen fancy tidies and towels per week, besides other articles. The price varies from \$5 to \$15 per dozen. A brief sketch of the origin of the industry here will be read with interest:

About thirty years ago the Sultan of Turkey courteously received an English gentleman and very kindly showed him many hospitable attentions. The gentleman—a member of the firm of Christy & Co., manufacturers of hats—among other things noticed the peculiar round-about manner in which the Turkish ladies made the rough kind of towel known to the world as Turkish towels. These towels were very highly prized in European countries, and at that time commanded a good price. On his return home the gentleman described to his foreman, Mr. Holt, the process practiced in the East of pulling the loops from the cloth by bamboo canes, and hinted to him that the same result obtained by machinery would have many advantages. Mr. Holt after some time hit upon a plan which, in 1851, was patented in England for fourteen years, and the manufacture of these goods under this patent soon became very remunerative to Christy & Co. They pay an annuity to their old foreman which he still enjoys, and in order to receive further recompense for his own ingenuity, Mr. Holt, seven years ago, started the manufacture of "Terry" goods, as they are sometimes called, in Paterson.

The advantages of this mode of manufacturing are very decided. The loops on each side of the cloth are produced by a peculiar reed motion in the weaving, and, as may be supposed, are uniform in length, and the pile of the cloth conse-

quently of the same thickness throughout. This style of weaving is applicable to either woolen, cotton or linen fabrics, and is becoming quite popular in towels, tidies, mats, children's dresses, ladies' sacques, upholstery goods, etc. As there is no end to the variety of patterns which can be made, and as many different materials can be used, a manufacturer has at his command a great field for his exertions, and the business has become a staple. Importation in this line has ceased almost altogether since the commencement of the home factories.

Another, smaller, concern in this line is established at the Duck Mill, where Robert Holt, who has been a resident of Paterson for ten years and who has for the past two-and-half years been engaged in making Turkish tidies and towels, employs about twenty hands, running sixteen looms.

There is still another engaged in the production of this class of goods in a small way. J. Miller, at No. 126 North Main street, commenced in 1877 to make Turkish towels, wash cloths, tidies, etc., which he disposes of himself directly to New York dealers. He has five power and two hand-looms running, and all the work is done within the family.

At the corner of Genesee avenue and Paxton street, South Paterson, is found one of the most interesting of Paterson's industries. Here Philip Schott has for several years been engaged in the manufacture of counterpanes and other goods composed of cotton and wool, in an endless variety of designs. Mr. Schott was employed as a workman in this branch for about fifteen years at a wage averaging \$4.50 per week, and after accumulating the modest sum of \$25 he started on this limited capital to manufacture on his own account, and has succeeded in building up a very remunerative business, in which he employs from ten to twelve hands, to whom are paid in wages \$4,500 per annum. The mill, a model industrial hive, owned by the proprietor, is in size 40x60 feet, two stories in height. The annual production is 17,500 counterpanes; the total value \$22,750. The goods are in plain white and in fancy designs and colors and are regarded with great favor, as equal in texture, style and finish to any other in the market, every process of the interesting manufacture being carried on under the immediate supervision of Mr. Schott.

Alexander and George McLean, brothers, began the manufacture of mosquito netting and buckrams in Paterson about 1848, at the old Beaver Mill, the business in Paterson being but a branch of a parent establishment in New York city. About 1868 the firm occupied a portion of the Franklin Mill, where they were burned out in the fire that occurred there in 1870, and left Paterson for a time, carrying on the business in Troy, N. Y. Some years later they returned to Paterson and leased the mill at present occupied, on Water street, belonging to Samuel Pope, where they prosecuted the manufacture with success. A few years ago the junior partner lost his life through the falling of a building in Passaic City, since which time Alexander McLean has continued it alone. There is no spinning done at the Paterson factory, only the sizing of the yarn, preparing of the warps and weaving. About 35 to 40 hands are employed.

The status of the cotton industry in Paterson at the close of 1881 may be represented, statistically, as follows :

Pounds of raw cotton consumed per annum,	-	-	-	3,850,000
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Total value of raw material used yearly, about	-	-	-	-	-	\$550,000
Total number of cotton looms in motion,	-	-	-	-	-	1,350
Number of spindles running on yarns,	-	-	-	-	-	53,500
Number of operatives employed,	-	-	-	-	-	950
Total amount disbursed for wages yearly,	-	-	-	-	-	\$253,600
Pounds of cotton warp produced yearly,	-	-	-	-	-	275,000
Pieces of mosquito net, " "	-	-	-	-	-	3,650,000
Towels, tidies, etc., dozens, " "	-	-	-	-	-	5,000
Counterpanes, " " "	-	-	-	-	-	17,500
Square feet of floor space occupied,	-	-	-	-	-	215,400
Total amount of capital invested,	-	-	-	-	-	\$875,000
Total horse-power employed,	-	-	-	-	-	675



CHAPTER XVI.

COTTON BLEACHING, DYEING AND PRINTING.

THE first works in this State of which there is any record where cotton bleaching was done by chemicals were erected by James Shepherd in 1813, on Ackerman's brook, near Acquackanonk, where cotton goods were beetled and finished after the European style for the New York market. Subsequently Mr. Shepherd removed to Connecticut, but returned to New Jersey and resumed business near Little Falls. In 1837 he removed to Paterson and erected the Washington Bleach Works, afterward purchased by Danforth, Cooke & Co. and incorporated into the works of that firm. The site of the bleachery was between the original Danforth premises and the Grant Locomotive Works. When the property was sold Mr. Shepherd retired from business, and a local historian has left on record the fact that he was "one of the few pioneer manufacturers of Paterson who never had to compound with a creditor."

The Society for Establishing Useful Manufactures commenced bleaching by hand as early as 1794, but do not appear to have done anything very important in the business until 1836, when they erected a large building on the upper canal for Mr. Maitland, who occupied it for bleaching cottons. After passing through a number of hands the premises were finally absorbed by the Rogers Locomotive Works.

In 1840 Christian Huber commenced bleaching, coloring and spooling yarns for trimmings and fancy work. The place occupied by his factory was formerly a dreary fen, but, by his own almost unaided exertions, he converted it into a beautiful and attractive spot. The site is on River street, near Paterson. Mr. Huber retired from business about 1871.

John Murphy in the beginning of 1858 established the Victory Mill, on the old road to Little Falls, for the purpose of bleaching yarns and cotton flannels, a new branch of the cotton industry in Paterson. Previous to this attempt of Mr. Murphy yarns were sent out of the place to be bleached, and orders were not taken for fabrics the production of which involved this process. The business was prosecuted for some years with fair success, twenty hands being employed, the product averaging 3,000 lbs. per day. Mr. Murphy, also, has retired from business, and this department of industry is now represented in Paterson almost exclusively by

THE FRANKLIN MANUFACTURING COMPANY,

which was incorporated in 1854. It was the intelligence and energy of the late D.

G. Scott that have made bleaching, dyeing and printing cottons one of the great industrial features of Paterson. He commenced in 1849 to weave and bleach towels and diapers. Two years later he purchased the Franklin Mill and added to his business dyeing and the printing of canton flannels by machinery, for linings, etc. This article in a short time superseded woolen for linings almost altogether, and drove it from the market.

In 1855 Mr. Scott, finding the demand largely increasing, purchased another plot and built the Waverly Mill, which was accidentally burned down two years later, but soon rebuilt in a most substantial manner, the new structure combining architectural elegance with convenience and ample capacity. It is rated as one of the most complete in every respect and most thoroughly equipped of any establishment in this branch in the United States, the machinery being all of the very best description. The production of materials for coat linings was immense. The bleaching of shirtings and the printing of maddered calicos and pantaloony goods was for many years a very important branch. Mr. Scott was the first to produce these goods by machinery.

In 1861 the works were transferred to the Franklin Manufacturing Company, for which a charter had been granted by the Legislature in 1854, the management being still with Mr. Scott until 1863, when he died, and was succeeded in the direction by his son, William G. Scott, who remains at the head of the business.

The company carried out the ideas of their predecessor by completing the erection of a third factory, on the Mallory Mill lot, adjoining the Waverly. The Franklin Mill property was soon after abandoned. A few years later, finding additional room was necessary, the adjoining Passaic Mill (No. 1) property was purchased. The printing of calicoes alone has entirely occupied the attention of the company for some years. In 1876 alizarine, the coloring matter in the madder plant, was commercially produced by two German chemists from coal tar, which, being in a concentrated form, allowed a greater rapidity of speed in the machinery, and so simplified the process of printing as to allow of a two-and-a-half times greater production with less labor than before the discovery of artificial alizarine.

The company have now room for ten printing machines and all bleaching, dyeing and finishing machinery in proportion. Three hundred and eighty hands are employed. The works are capable of converting into dress fabrics 2,100 pieces of print cloths, of 50 yards each, per day. But during 1881 only four printing machines and accompanying machinery were used, owing to the overproduction caused by the improvements in coloring matters, as above noted.

According to William Wright, who furnished the series of sketches of Paterson industries published in the *Scientific American* in 1859, there were at that time 300 hands employed; \$9,000 per month was paid in wages; \$100,000 worth of chemicals was used and 2,000 tons of coal were consumed by this company yearly. Judging from this the industry has not greatly expanded in the past twenty years, save in the direction of improved machinery and materials.

CHAPTER XVII.

THE IRON INDUSTRY.—MACHINERY.—1800-1825.

IN this work, devoted to a portrayal of the rise and progress of the most important of the manufacturing and mechanical industries, a comparatively large place should be given to the department of machinery. In no other field has the vigor and courage of American industry and skill been more remarkably displayed, and, as will presently be shown, Paterson mechanics have for the past three-quarters of a century held a place in the front rank, standing with the very first in this or any other country.

Ninety-six years ago the Legislature of Massachusetts appointed a joint committee, "to view any newly invented machines that are making within this commonwealth, for the purpose of manufacturing sheep's and cotton wool and report what measures are proper for the Legislature to take to encourage the same." Since that day there have been invented and introduced, the power-loom, the cotton-gin, the card-setting machine, the compound-gear, speeders, the cap-spinner, the ring-spinner, self-acting mules, self-stripping cards, the helicoidal shearing machine, the endless roving or American card, burring machinery, felting machinery, carpet looms—all the ingenious machinery for work to which machinery is applicable, machines for saving labor and increasing the product in every department. But the record of American invention in the creation of textile machinery alone is the admiration of the world, and has added an immense power to its manufacturing force. The names of Danforth, Moody, Gay, Whitney, Arnold, Mason, Wellman, Whipple, Bigelow and Bancroft, will not be forgotten so long as the beauty and power and grace and strength of American machinery remain and challenge, as they now do, all rivalry, and so long as labor-saving machinery shall be recognized as one of the wealth-producing and civilizing agents of the world.

According to a paper read before the Atlanta Cotton Conference, in 1881, the amount of capital invested in all the various branches of machine-making in this country is \$40,000,000, the usual value of the production is nearly \$20,000,000, and the number of hands employed is more than 20,000.

As an agent for the development of our resources, as a field for quickening the American mind, and the cultivation of American taste, the invention and manufacture of machinery in all its forms holds a high place among the arts and indus-

tries which we have learned to protect and cherish. This, as already intimated, is especially true in respect to the triumphs achieved in the department of textile machinery. Here might the spinners and weavers of ancient fabrics find even their skillful fingers outdone by the delicate machinery which is driven by a giant's force and guided, as it were, by a giant's brain.

More than forty years ago the mechanics of Boston were told, by the most accomplished orator of that day, that "the man who, in the infancy of the arts, invented the saw or the plane, the grindstone, the vise or the handmill, and those who, in later periods, have contributed to the wonderful system of modern machinery, are entitled to rank high among the benefactors of mankind, as the fathers of civilization, the creators, I had almost said, of nations." Sympathizing with this prophecy, now so well fulfilled, a Representative from Massachusetts recently remarked on the floor of Congress, that "the manufacturers of America, the producers of the textile fabrics which have charmed the world, the inventors of machinery which seems almost instinct with life, the creators of imposing structures which beautify our towns and span our streams, the diligent, patient, careworn guides of splendid enterprises which are our pride and the envy of our rivals, are among the most useful and honorable laborers in our country."

This is no more than a just eulogy. Commencing life, in almost every instance, as operatives in the industry whose intricate operations they comprehend (which is singularly true of Paterson mechanics), they have gone on, step by step, patient and undaunted under adversity, and prudent in prosperity, until they have created a vast industrial community, upon which the vital force of our country leans largely for support. In war they poured almost uncounted wealth into the treasury of a struggling Government. In peace they have inspired the industry and activity of a producing people with such majestic force that all the sophistries of theorists and the designs of repudiators have failed to prevent the steady approach of our country to solvency and honor.

It was about the year 1800, and while Judge Park was occupying the first cotton factory built and started by the Society for Establishing Useful Manufactures, that John Clark, father of the late Edward and Henry Clark, came to this country from Paisley, Scotland, settled in Paterson and was employed by Mr. Park in his factory as a machinist. This was really the beginning of the iron industry in Paterson. "It was then," as the late John Cooke very aptly remarked, in his Centennial article on "The Iron Industry of Paterson," "that the twig was planted which has since grown into the vigorous tree."

John Clark was probably the first to make anything like a business of constructing machinery in Paterson, though it is on record that George Parkinson was engaged in making machinery for spinning flax, hemp and wool as early as 1793, under the auspices of the Society. A portion of the factory continued to be thus occupied until the suspension of the Society in 1796.

Mr. Clark prosecuted the business in the Society's factory very successfully, at first for Judge Park and afterward on his own account, and quite extensively for that early day. He filled numerous orders for the East and is said to have built the first wool machinery ever made in this country. The machinery of that day was

composed principally of wood, the few portions made of iron being either imported from England or supplied by the mechanical establishments outside of Paterson devoted to particular branches of the iron industry and delivered by them to the factory, where they were fitted to the wooden frames then made. Mr. Clark finally leased the whole building and continued the business there until the Summer of 1807, when the mill was burned, it was thought through spontaneous combustion of cotton waste. During a portion of this time he was associated with a man named McIlwhame; doubtless, judging by the name, of Mr. Clark's own nationality.

Late in the year 1807, Mr. Clark was engaged in fitting up the machinery of a factory that had just been erected on what was afterward known as the Nightingale lot, in Van Houten street. In 1809 he started a small shop and factory, which he occupied until 1816 or thereabout, on the lot in the rear of the site of the present Beaver Mill, where he made machinery and carded wool brought to him by the country people in the vicinity of Paterson. In the following year he took two apprentices, William Kane and Henry H. Post, to learn the business. They are said to have been the first boys indentured to learn a trade in Paterson. The last-named, who lived long at 54 Market street, often referred with pleasure to the kindness of his old master, in whose family the apprentices lived; and of his frequent trips to the foundry of General Colfax, at Pompton, for castings, Paterson being yet without that necessary appendage to a machine-making establishment. Mr. Post became a very prominent citizen. He died in 1878, at an age exceeding eighty years, and with not a gray hair in his head, a notable specimen of the sturdy and virile men who laid the foundation of Paterson's greatness.

While working with Mr. Clark as an apprentice Mr. Post on one occasion told his employer that he wanted to buy an overcoat, upon which he received an order on Abraham Godwin, the storekeeper of Paterson at that date, from whom he purchased the cloth, which he took to Haledon, to a tailoress, to make up, there being no tailor nearer than that suburb. This incident is mentioned to show the primitive manner of doing business in the beginning of the century. Mr. Post afterward married a daughter of General Abraham Godwin, the elder, a sister of the second General Abraham Godwin, and for many years kept the Passaic Hotel, which was the property of the Godwins, who at about that date owned nearly all the land in that vicinity.

Some time subsequent to 1811 Thomas Rogers, who had recently come to Paterson, where he found employment as a carpenter, was given work by Mr. Clark in his machine shop, and it is on record that his employer found the future pioneer locomotive-builder remarkably ingenious and full of energy, and that he made some valuable improvements in the machinery they were engaged upon.

After many years prosecution of the business, with varying success, about 1816 John Clark the elder retired, and his son John Clark, Jr., succeeded him, and soon after associated with himself first, Thomas Rogers, and, later, in 1822, General Abraham Godwin, the firm being known as Godwin, Rogers & Co. About this date the shop was removed to the present site of the Danforth Locomotive and Machine Company's Works, and one year later the firm added the foundry plant of William Jacobs, which also they removed to Market street opposite their other works,

where a machine shop and foundry were built. Thus, after twenty-three years in its various branches, the iron industry connected with machine-making was fully established in Paterson under one management.

The three men associated in the business, as pioneers of what has since become a great industry, were of no common stamp. A brief sketch of Mr. Rogers appears in its more proper connection in another part of this volume, treating of the locomotive industry, of which he was the pioneer. Abraham Godwin, Jr., was not only the strongest partner financially but could boast of a somewhat more illustrious parentage than the others, his father, General Abraham Godwin, having been distinguished in his day as a brilliant officer and serving during the Revolution on the staff of General Washington, as aid. Both Generals Godwin, father and son, were at different periods proprietors of the then famous "Godwin House," now the Passaic Hotel, the former before the Revolution and afterward, at least as late as 1807. Parke Godwin, late of the *New York Evening Post*, is a son of General Abraham Godwin. Parke Godwin was born in Paterson, February 25th, 1816, and graduated at Princeton College in 1834. He was afterward admitted to the bar in Kentucky; from 1837 to 1843 he was editorial contributor to the *Post*, then edited by his father-in-law, William Cullen Bryant. Later he started the *Pathfinder*, a literary and political weekly, but shortly afterward resumed his connection with the *Post*, of which he was long managing editor. He was at one time an editor of *Putnam's*, has written a political history of France, books of travel, biographical works and tales.

Besides John, the eldest son, and Elisha, the next in order, and William the third, the elder John Clark had three other sons, Edward and Henry, who survived until a few years ago, so that they are remembered by most of the present generation, and one other. For many years Edward and Henry Clark kept the hardware store at the corner of Ellison and Main streets, the present owner, Morton Clark, being a son of Edward. Edward and Henry were among the youngest of the children. William was for many years a bookkeeper, first for John Colt at his store, or rather that of the Society, at the Southeast corner of Market and Main streets; afterward in the office of the Rogers Locomotive Works. Elisha engaged in the cotton manufacture, being senior partner in the firm of Clark & Robinson, who had a mill on or near the site of the present Ivanhoe Paper Mill. Robert O. Robinson, the partner, was at one time Sheriff of Essex County, before Passaic County was formed. It remained for John, the eldest son, to follow in the footsteps of his father, whose name he bore, and to continue the prosecution of the iron industry.

In addition to the works of Godwin, Rogers & Co., at the time they were firmly established in Market street, there was also a number of smaller machine and blacksmith shops and foundries in Paterson, their principal business being in the line of jobbing and repairs for the cotton mills then in operation.

In January, 1822, P. F. Herbin had a foundry on "Park" street (now lower Main street), the size of which may be judged by the fact that he used an ordinary blacksmith's bellows to blow his furnace. It was about this time that William Jacobs and Henry Worrel had a foundry on the rear of the Van Winkle lot in Van Houten street; it was afterward purchased by Godwin, Rogers & Co. William Parrot

had a machine-jobbing shop in the "Young Beaver" Mill about 1822, after Godwin, Rogers & Co. left it. E. Youle had a foundry on the site of the Lutheran Church, Van Houten street, in 1822. This was but a short time in operation, the building being afterwards occupied by John Vail, as a blacksmith shop, where he made edge tools. Ryerson & Post, the latter an apprentice of John Clark, as before noted, had a small place in 1824 on the site of the old Van Winkle shop, afterward burned; here they made machinery for many years for the Phoenix Mill, mainly for the manufacture of flax.

This brings us to 1825, at which date, according to Dr. Fisher's statistics, there were in Paterson eleven blacksmith, and two millwright shops and one foundry with a capacity of two-and-a-half tons of castings per week. Seventy-seven hands were employed in the various machine shops.

Godwin, Rogers & Co. continued to do a successful business until 1831, when Mr. Rogers sold his interest to Messrs. Godwin and Clark and established himself in business alone in the new Jefferson Works, adjoining the present Ivanhoe Paper Mill, with a foundry opposite. Early in 1832 a copartnership was formed with two New York capitalists, Messrs. Morris Ketchum and Jasper Grosvenor, and the business of making cotton, wool and flax machinery exclusively was carried on here until 1836, when locomotive-building was added. In 1867 the building of machinery was abandoned and the entire works devoted to the locomotive industry. After the retirement of Mr. Rogers Messrs. Godwin and Clark associated with them Charles Danforth, destined to become in future years one of the very foremost men as an industrial pioneer in Paterson.

Mr. Danforth, who had already won for himself an enviable reputation in connection with his improved spinning-frame, was born near Taunton, Mass., probably at Bristol, his father being a cotton manufacturer in his native town. About 1824-5 Charles went to Matteawan, Dutchess County, N. Y., where he worked as an operative in one of the mills. At this period so tall and lanky in figure was he that he earned the sobriquet of "Big Indian"; but at the same time he gained the respect of all, his native ability, practical sense and energy being soon recognized. While at Matteawan he married a Miss Willett, a young lady of excellent family, though a factory girl. It was no uncommon thing in those days for the daughters of the most respectable and well-to-do families to find employment in the mills. A few years later we find Mr. Danforth in Newburgh, whither all his belongings, including his wife and only child, were conveyed in two wagons. Later he was employed in a cotton factory at Sloatsburgh, on the Ramapo, in the cotton factory of the Sloats, where he invented the Danforth spinning-frame, which bears his name and the fame of which has since become world-wide. It was not perfected at that time, for Mr. Danforth made many improvements on it after he came to Paterson, which he did in 1829. There is a tradition that when he first entered Paterson it was in somewhat the same manner as Franklin's entry into Philadelphia, his clothing being tied up in a pocket-handkerchief and carried in his hand. This is probably an exaggeration of his humble condition. For nearly two years he experimented with his new invention in Paterson, after which he went to England, where he built frames, at Manchester, and was the successful rival of such celebrated mechanics as

Sharp, Roberts & Co. and others, among the most famous in Europe. He returned to Paterson after having sold the patent right of his spinning-frame for use in England, and was associated with Messrs. Godwin & Clark. Neither of the partners in the new firm were overstocked with means at the time, the payment to Mr. Rogers of his share, nearly \$40,000, having crippled Godwin & Clark, and Mr. Danforth having very little if any means, his capital consisting mainly, if not wholly, in his invaluable invention. Still, the new firm were fairly successful, the reputation of the wonderful spinning-frame creating an abundant demand for machinery, and orders soon poured in, so that the works were not capacious enough and they were accordingly enlarged. Mexico was then making an effort to enter on a career of industrial progress, and Paterson shared abundantly in her favors, not a few of which ultimately took the shape of claims against the United States Government, to be settled at a considerable loss, in many instances, and after vexatious delays. A great deal of money was made during these few years, and much lost. About 1839 the firm found themselves "in waters shallow," and the concern was finally compelled to succumb. A receiver was appointed and the works closed. After they had stood idle some four or five months Mr. Danforth hired them from the receivers, and soon after, August 3d, 1840, purchased them, remaining sole proprietor until 1848, when the late Major John Edwards, who had been employed at the works from a boy, and who had long been a most efficient foreman, was received by Mr. Danforth as partner. After this date until 1852 the firm was known as Charles Danforth & Co.



CHAPTER XVIII.

THE IRON INDUSTRY.—MACHINERY.—1825-1850.

BETWEEN 1825 and 1850 a number of machine shops were started. About 1829 Sandy Paul, Hugh Beggs and David Hogg established themselves in a shop on the site of or near to the old "Jacobs" foundry, Van Houten street, which had been vacated by Godwin, Rogers & Co. In 1830 they moved to a new shop on the site of the present Ivanhoe Paper Mill, which was burned in 1835, and with it was consumed an almost completed locomotive engine, the very first attempted in Paterson of which there is any record. After the fire the firm of Paul & Beggs dissolved partnership; Paul left Paterson and went to Maryland, where his sons are still living and are noted as eminent machinists. Mr. Beggs remained in Paterson and built the Union Works, opposite the shop that was burned, where he remained until his death, nearly ten years later, in 1844. After his death the works were kept in operation by the family of deceased until 1848, and after that date by Evans & Thompson, until about 1852-3, when the tools and patterns were sold at auction and the building put to other uses.

William Beggs, who was the builder, until it neared completion, of the locomotive alluded to, was a brother to Hugh. After the fire which consumed his work he became master mechanic on the New York Central Railroad, a position which he held for many years, being a man of excellent ability. During the existence of the firm of Paul & Beggs, and after Mr. Beggs rebuilt and continued by himself, the business was mainly millwrighting, and workmen went forth from the shop to all parts of the country putting up wheels and machinery for cotton, woolen and grist mills, there being few capable millwrights in those days.

There is no better record extant of the progress in the department of machinery at this and subsequent periods than is found in that most valuable paper on "The Iron Industry of Paterson," to which frequent reference is made in this work, prepared by the late John Cooke and incorporated in the Centennial report of the Paterson Board of Trade. Mr. Cooke's account of the operations at this period is as follows:

"For many years there was a large machine works at Oldham, the buildings having been erected for the purpose of making powder. About 1826 Benjamin Brundred commenced making cotton and wool machinery here. In 1834 he had as partners Samuel G. Wheeler & Co., the name of the establishment being the Oldham Works. Wheeler failed in 1837. The works were burned in 1838, when Brundred moved to Paterson, to the building on "Congress," now Market, street known

as the 'Old Hotel.' Here the establishment was known as the Paterson Machine Company's Works. The buildings were burned down in June, 1848, at the same time St. Paul's Church was consumed. After the fire Brundred kept in operation the shop at Oldham, which had been rebuilt, until his death in 1853, when it was closed and the tools were sold.

"Plunkett & Thompson commenced in the Franklin Mill about 1826, from which place they removed to the Beaver Mill, and afterward to the Nightingale Mill. They carried on quite an extensive business, employing sixty to seventy men. In 1834 they dissolved partnership and left Paterson.

"Robert Laclison, Truelove and others had a shop about 1830 in the Beaver Mill, whence, after about two years, they removed to Bloomingdale, on the border of Morris County.

"Affleck & Dunmire had a millwright and jobbing shop in the old Nail Factory until it was torn down in 1835 to make room for the Gun Mill, after which they were lost sight of.

"About this time (1835) the Patent Arms Manufacturing Company built the Gun Mill, for making Colt's revolvers, the first arm of the kind ever produced in this country. They did quite a large business but were financially unsuccessful, and in 1841 the company failed. The invention was probably in advance of the times. The Colt Patent Arms Company was then formed and located in Hartford, Conn., accepting the favorable inducements offered there.

"In 1841 William Bradley and two of his brothers three young men who had been working for Rogers, Ketchum & Grosvenor, erected a wooden building on the site of the present works of the Machinists' Association, where they made machinery, principally for flax and hemp. Their shop burning down in 1847, they rebuilt it of brick and occupied it until 1849, when they failed and moved away, going to Richmond, Va.

"Samuel Smith and Abram Collier started a small foundry in 1841 on the corner opposite the afore-mentioned Bradleys' shop. They did a general business, not very extensive, using horse-power for blowing their furnace, an improvement on Herbin's method (a common blacksmith's bellows) of twenty years previous. Smith sold his interest to Collier in 1843, who subsequently sold to Richard Thompson, who moved the business to the corner of River and Mulberry streets, to the place now occupied by Daggers & Row, where it was continued until the death of Thompson, in 1850.

"In 1843 Samuel Smith, his brother, William Smith, Judge Whitely and Thomas Beggs started a machine shop and foundry in the Franklin Mill. Shortly after they commenced the late James Jackson and Patrick Maginnis bought the interest of Whitely and William Smith, respectively, after which the business was continued under the name of Beggs & Smith until 1844, when Beggs died and William Swinburne, who had been Superintendent for Rogers, Ketchum & Grosvenor, became one of the company, the name being changed to Swinburne, Smith & Co. They did a general machine business until 1848, when, on the opening of the Eastern Division of the Erie Railway, they built the shop on the Franklin Mill lot, afterward occupied by D. G. Scott, and commenced building locomotives, discontinuing entirely their machine and jobbing department.

"In 1844 Anderson & Buckley began the manufacture of spindles and flyers in one of the shops on the Nightingale lot. In 1846 or 1847 they removed to the Hamilton Mill, about which time Anderson died, when the business was continued by Benjamin Buckley.

"In 1844 Joseph C. Todd and Daniel Mackey started a very small shop in the Nightingale Mill. They had at first but two lathes, one of which was borrowed, one upright drill, and little else. They moved two years after to the basement of the Bradley shop, where Philip Rafferty joined them, the name of the firm being

thereafter Todd, Mackey & Co. In 1850 they removed to their present location, the old Holsman Mill. Their business is making flax, hemp and silk machinery."

This brings us to 1850. During the quarter of a century that had elapsed since the last report of Rev. Dr. Fisher, the reliable statistician of the period, the progress in the department of machinery had been very great. There were in Paterson in 1850 six machine shops, each with its adjuncts of foundry and blacksmith shops, the industry employing in all about 1,450 men. The output of the foundries of castings used in building machinery aggregated forty to fifty tons weekly. There were, besides, a number of smaller establishments, of which little is known, no record having been kept of their operations. These were engaged mainly in jobbing.

At about this period a very important feature was added to the department of machinery, growing out of the necessities of a new industry, the silk manufacture, which was just coming into prominence. During the early part of the century silk was reeled on the ordinary hand-reel and spun on the ordinary large wheel used for spinning wool, though it is true that about the year 1800 Horace Hanks had invented a double wheel-head which somewhat facilitated the spinning of either cotton, wool or silk. But the completed product of those days would compare with the present about as the old-fashioned homespun would compare with a finished broadcloth. It is on record that as early as 1815 William H. Horstmann, afterward at the head of one of the grandest silk industrial establishments in this country, located at Philadelphia, came from Cassel, in Germany, and, beginning to manufacture braids in Philadelphia, soon after invented and made some crude silk machinery. He was the first in this country, according to excellent authority, to introduce the Jacquard machine, which he did in 1824. In 1837-8 he, together with his son William, made power-loom for narrow goods.

It is recorded also that in 1827-8 Alfred Lilly, a member of the Mansfield (Conn.) Silk Company, from rude drawings by Edward Golding, made the first successful silk-throwing machinery produced in this country. Some time afterward he made what is said to have been the first successful silk reel of domestic manufacture. Golding was a young English throwster of excellent ability.

Among the earliest to make silk machinery in Paterson, if indeed he was not the pioneer in that department, was Charles Moseley, who was at first employed by John Ryle, in the Gun Mill, at a very early period, in making and repairing silk machinery, and who afterward prosecuted the business on his own account in the Gun Mill, in a portion of the Phoenix Mill and, perhaps, in other locations. It is believed that while Mr. Moseley was in the Gun Mill with Mr. Ryle the first silk machinery built by any concern in that line on their own account was turned out by Evans & Thompson, who are represented as having established a machine works, including a moulding shop and foundry, as early as 1850-51, in the Union Works, at the corner of Spruce and Market streets. The name of this old firm appears over the works to this day, though it is partially obliterated. The senior partner, John Evans, is an uncle to William W. Evans, Treasurer of the Grant Locomotive Works, and is now engaged in building machinery at Davenport, Iowa. The firm were succeeded, after a few years occupancy of the Union Works, by the late Thomas D. Hoxsey, who established a cotton mill there.

CHAPTER XIX.

THE IRON INDUSTRY.—MACHINERY.—1850-1875.

FOR the following further account of the growth of the machinery department of the iron industry during the period from 1850 to 1875 the writer is once more largely indebted to the article prepared by Mr. Cooke in 1876:

"John E. Van Winkle commenced business in 1849, making tools and cotton machinery, and soon his production of his patent "cotton-opener" was very large, the demand being great.

"William Swinburne retired from the superintendency of the New Jersey Locomotive and Machine Company's Works in 1851, and built the locomotive shops at the corner of Market street and the Erie Railway.

"The Paterson Steam Fire-Engine Works were first located in the Franklin Mill, in 1867, whence they were removed to the site of a part of the present Watson Works, where the business was carried on until 1872, when the works were sold, Richard Harrell, who was interested in the old company, continuing the business in the Pas-saic Mill, where it is at present conducted.

"T. C. Simonton erected the buildings at the corner of Paterson and Ellison streets in 1853, and commenced a steam fire-engine works, the first in the city devoted exclusively to that branch of the iron industry. He remained until 1860, when he sold out and retired, for the time, from business.

"In 1851 Thomas and John Wrigley, gumming saw manufacturers, began the making of flat chain washers, oakum card teeth, &c., in the Todd & Rafferty Works. They dissolved partnership in 1855, since which the business has been carried on by Thomas Wrigley, whose works are on Railroad avenue, where they have been since 1863.

"Charles Moseley has been making silk machinery since before 1865, first in the Gun Mill and then in the Phoenix Mill, and afterwards again in the Gun Mill, to which latter he last removed in 1870, and where he is now doing a good business.

"In 1863, Bradley, Godden & Co. started a machine shop in the Nightingale Mill. In 1865 the name was changed to Holden, Godden & Co., and in 1866 it was again changed, the establishment thereafter being known as The Industrial Works until 1870, when operations were discontinued.

"Watson & Nussey commenced machine making in 1865, in the rear building on the Nightingale lot. They moved into the shop vacated by the Industrial Works in 1870, where they entered into the manufacture of flax and jute machinery. They dissolved partnership soon after, when, Nussey associating himself with John H. Remig, the firm of Nussey & Co. was formed.

"James Dunkerly, roller maker, started in business in the Hamilton Mill in 1856, and removed to his present quarters, on Spruce street, in 1858.

"Joshua Mason has a shop on the rear of the Gun Mill lot, to which he removed since the late VanWinkle fire. He has perfected a radiator of his own invention, which he is now manufacturing, having supplied Bellevue Hospital, New York city, with them, they being regarded as the most perfect radiator known.

"George Addy commenced the business of bolt-making in a little shop on Broadway in 1851. He is now located on the river bank, doing an extensive business in making bolts, smut-machines, mowing-machines and straw-cutters.

"The Whitney Sewing Machine Company started in 1870. Becoming embarrassed, the works were sold and the present company organized, under the name of the Whitney Manufacturing Company. They are doing a successful business, sending their machines West, mainly. Their capacity is 500 machines per month.

From other sources than that which furnished the foregoing additional data have been gleaned of the operations of former years up to 1875, in the department of machinery. After the death of Benjamin Brundred, of the Oldham Works, in 1853, the buildings were occupied by several parties until, in 1859, the property passed into the hands of an English company represented here by William and Charles Hodges. A few years subsequently it was permanently closed as a machine works; it has since been occupied for other purposes.

Of T. C. Simonton & Co., who have been recorded as discontinuing the business of steam-engine building in 1860, William Wright, in his series of articles in the *Scientific American* on "The Manufactures of Paterson," published in 1859, says: "This concern has been enlarged to double its former dimensions by the erection of a new foundry, smith shop and boiler shop, and has a force of forty men employed, chiefly on stationary engines. Great numbers of these have been sent to the Southern and Western States, to Mexico and to South America. The proprietors execute orders for millwright work, silk machinery, braiding machines and the like. They are now building a Blanchard boiler, with a patent cut-off, for the Essex Mill, claimed to effect a saving of 50 per cent. in the consumption of fuel. Steam-power is used to drive the machinery. The value of the work annually turned out is about \$100,000."

James Dunkerly, who started in the Hamilton Mill in 1856, in 1859 had just completed a new shop for making fluted and plane rollers for flax, wool and cotton machinery. Tunstall & Beggs at the same date had commenced to make machines for rolling and stretching wire, as well as doing most kinds of millwright work. R. Thompson's Passaic Foundry and Machine Shop was started about 1860.

There was a time when the Empress Eugenie was thought to be deserving of more than honorable mention by the mechanics of Paterson, for her making "broad the phylacteries," or translating the feminine skirt from its old elliptic and parabolic curves to the more graceful as well as more ample circle. Twenty years ago at least a dozen firms, employing several hundred persons, were engaged constantly in making braiding machines, drawing and tempering steel, braiding the steel, and forming it into skirts. William Crossland is said to have been the pioneer in this particular industry, having engaged in it about 1855, before a single American-made hoop had been trundled into market. He employed from 25 to 30 hands. About the same time William H. Chamberlain, Jr., was also engaged in the business, carrying on every process of the art of converting the bar of steel into the full-blown article. This, it is said, was the only establishment in the United States

where the entire manufacture was completed under one roof. Wires for watch springs, sewing machines and the like also were produced. Watson & Fielding and Watson & Romaine were engaged in the same character of business.

It is on record that the most extensive concern prosecuting the manufacture of copper flues, smoke stacks, cylinder heads, brass domes, jackets and other descriptions of ornamental work for locomotives, and all other articles in this line, about 1860 and prior thereto, was Nathaniel Lane, who was among the first in the field. The brass mountings on the magnificent steam fire-engines turned out from the Novelty Works, New York, were from Mr. Lane's shop. Horatio Moses, who formerly occupied ex-Alderman Robert McCulloch's place, in Van Houten street, William Cundell and Robert Hayes were also pioneers in this industry, and they were succeeded by William H. Hayes, Robert McCulloch and Lane & Co.

The Whitney Sewing Machine Company began business in the Dale Mill about 1870, the product being the elaboration of an invention of Mr. Whitney, from whom the machine acquired its name. After a comparatively brief existence as the Whitney Sewing Machine Company, financial embarrassment compelled the concern to go into liquidation, and a reorganization followed, under the title of "The Whitney Manufacturing Company," which was more successful, the volume of production at one period, about 1875, being 400 to 500 "improved Whitney" machines per month. The "improved Whitney" more nearly resembled Mr. Whitney's original invention, the "Weed," than any other machine, modified of course by the result of experience. Quite a peculiar feature of the business as conducted in Paterson was that the company dispensed altogether with "middlemen" or agents, selling machines directly to the customer, and giving each buyer the usual agent's commission. This plan was adopted principally from sympathy with the Grange movement, which had for its object the bringing directly together of the manufacturer and the consumer, and on this account the Whitney improved was universally accepted as the sewing-machine of the Patrons of Husbandry. This new departure from the agency system was quite important to buyers of sewing-machines, for it is well understood that the commission of the agents amounts to nearly or quite as much as the original cost of manufacturing. After struggling for an existence during several years the industry was finally removed to Erie, Pa., where the business is controlled by a well-known capitalist, manufacturer and politician, named Noble.

According to the best authority, the total number of hands employed in the making of locomotives, stationary engines and machinery in 1860 was about 2,000, nearly half of them engaged on the first-named, of which about 135 were turned out yearly. The average amount of wages paid to the above was \$10,000 per week, or a half a million annually, to which should be added \$100,000 yearly for salaries. The total value of the product, locomotives, machinery, etc., was estimated at \$2,000,000 per annum. At the present date one of the Paterson locomotive shops alone (Rogers') disburses much more money for wages yearly than was paid in the combined industries referred to twenty years ago, turns out nearly three times as many locomotives per annum as all the shops existing at that date, and gives employment to about as many hands as the above-named branches taken together; the yearly value of the product is more than equal to the sum total named, \$2,000,000.

CHAPTER XX.

THE IRON INDUSTRY. —MACHINERY. —THE PRESENT STATUS.

IT remains to show the status of the business of machine-making during the past few years and up to the present date. In doing this reference will be made to the establishments whose beginnings have already been noted as well as to those of more recent origin. First among the machine-building concerns of Paterson must always rank

THE DANFORTH LOCOMOTIVE AND MACHINE COMPANY.

which, as the direct successor of John Clark, the elder, is the oldest established in the iron industry in Paterson. There have been many changes, but a continued operation has been maintained since the beginning of the century. Not many industrial establishments in the country can show a record like this. The origin and subsequent career of this enterprise, up to 1852, when locomotive-building was undertaken, has already been sketched, and it has been shown how from a small beginning it grew under the proprietorship successively of Rogers & Clark, 1816 to 1822; Godwin, Rogers & Co., 1822 to 1831; Godwin & Clark again, 1831 to 1840; Charles Danforth, 1840 to 1848; Charles Danforth & Co., 1848 to 1852, until it became one of the grandest industries in the country, which position it fully maintains to the present. From 1852 to 1865 the business was continued under the firm style of Charles Danforth & Co., Edwin T. Prall, who had long been bookkeeper for the firm, and John Cooke, who had been Superintendent of the locomotive department for Rogers, Ketchum & Grosvenor, having been admitted to partnerships. In 1865 a charter was obtained and "The Danforth Locomotive and Machine Company" was incorporated.

In 1859, besides a large cotton factory and extensive locomotive works, the machine shop of the company employed 175 hands; a foundry, the product of which was used in both departments of the iron industry carried on there, cast five tons daily; the annual sales of the company averaged more than half a million; the number of spindles turned out per annum was 10,000; they were chiefly of the Danforth patent. In 1867 the works of the company covered two acres of ground and the annual product included at least \$300,000 worth of cotton machinery, and there was a steady increase in prosperity until the panic came, in 1873.

The ground lost during these dark days has since been fully recovered, and the statistics of the establishment for 1881 showed a production of \$350,000 worth of machinery, equal to that of the palmiest days, the employment in this department of 250 hands (755 hands in all), with a total disbursement for wages, in all departments, of \$380,000; in the machinery department alone about \$100,000. Jacob T. Blauvelt, a veteran machinist, is Superintendent of the machinery department. The further record of this establishment will be found in that portion of this work which treats of locomotive building, to which branch about three-quarters of its entire capacity is devoted.

THE MACHINISTS' ASSOCIATION.

This concern was very early in the field and was among the first to manufacture silk machinery, though that was not exclusively its product. The association consisted at the commencement of seven practical mechanics, who formed a copartnership in 1851, each member contributing \$200 in money and a portion of his time. Their *debut* was made in an apartment of the Star Mill, where they manufactured cotton, wool, flax and silk machinery. They engaged in millwrighting also. Two years afterwards the mill was burned down, involving them in a heavy loss. Nothing daunted, however, they made a purchase of the ground and rebuilt the mill, a large four story brick edifice, adding a new foundry. Probably this has been one of the most successful examples on record of the results of associated labor. Eight years later the establishment was assessed at \$25,000, clear of all obligations. Much of the work turned out was sent to the Southern States. About one hundred men and boys were employed in the first few years, all the members, foreman included, following their usual avocations. The names of the original seven were: James Peel, William Senior, Job H. Kiersted, James Gillespie, Elias Morehouse, Jacob Wilie and William Holden. All, with perhaps one exception, had been employed in the Danforth Works prior to the formation of the association. About a year after the association was formed Henry Forbes, also, was admitted. Among the first orders received was one for silk machinery. Of the eight who about thirty years ago started this enterprise two only remain in the association, Messrs. Peel and Morehouse. Four of the remaining six are dead, and two, Messrs. Forbes and Holden, are living. From the commencement of business up to 1876 silk machinery had been built for nearly two hundred firms. The first order for Decker spring frames in the country was given to this firm in June, 1870, by J. H. Booth & Co., after which there was an immense amount of work ordered in this particular line.

The association claim that they are entitled to the honor and credit of priority and superior skill in completing a machine meeting the universal need of the domestic silk industry of the country. The establishment has fully maintained its prominence, and more than realizes the promises of its earlier years. The premises occupied are: main building, 112x45 feet, four stories; foundry, 80x40 feet; blacksmith shop, 30x40 feet; pattern house, 20x40 feet, two stories. The number of men employed is 110.

J. C. TODD'S MACHINE WORKS.

Todd, Mackey & Co., who purchased the Holsman Mill in 1851, where they put up a new foundry at that date, as already noted, continued to manufacture ma-

chinery there until 1855, when Mr. Mackey retired from the concern and purchased a farm in New York State, whereon he resided until his death, a few years later. The business was carried on thereafter under the firm name of Todd & Rafferty. In 1857 they added the building of steam-engines to their other business of making flax, hemp, cotton and silk machinery. For many years nearly all the rope machinery used in the United States and Canada was made by this establishment, and heavy orders were filled for Great Britain, Russia, Spain, China, India and other foreign states. About 1859-60 the enterprising firm "bearded the lion in his den" by despatching a large quantity of machinery to London to fill orders, a successful venture. Their stationary engines, furnished with Uhry & Luttgin's cut-off, were sent to all parts of the country, as well as to Cuba, Mexico and South America. In 1860 135 hands were employed. The firm occupied the old mill already on the ground until 1870, when new and extensive buildings were erected. The office of the old works is standing and is all that remains of the original structure.

In 1864 the boiler works of Rafferty, Smith & Co. had been established on Railroad avenue, the present location of Samuel Smith, who is among the foremost pioneers of "Industrial Paterson," in cotton and machinery especially. The firm was composed of Philip Rafferty, Samuel Smith, Joseph C. Todd and H. Uhry, the latter a French machinist of great eminence, an inventor of several valuable improvements. He had years before been Superintendent of the works of the New Jersey Locomotive and Machine Company. About 1868 Mr. Uhry sold his interest to the other partners and sailed for his native France, whence he did not return.

About 1872 the two branches of boiler-making and building machinery were consolidated, the Todd & Rafferty Machine Company being formed, all the partners in both establishments becoming members of the new corporation. The character and extent of the works at this date are thus described in Bishop's "History of American Manufactures:—"

"Todd & Rafferty's Machine Works in Paterson is the principal establishment in the United States for making hemp and rope machinery. The senior partner of this firm was the pioneer in this country in producing improved machinery for this purpose, and notwithstanding the want of governmental protection to the products of their works the concern founded by him has achieved a distinguished success, and now supplies the principal roperies, not only of this country, but of Great Britain, Calcutta and Australia. The buildings comprising the works cover about two acres of ground, and bear evidence of having been adapted to accommodate the requirements of a growing business. The principal machine shop and erecting room is one hundred and twenty-five feet long, about eighty feet wide, and four stories in height. The blacksmith shop contains a dozen fires, and to this is attached a building devoted especially to the construction of heavy machinery. Here are two large lathes, one capable of turning twenty-two feet in diameter and the other twelve feet. The foundry is of brick, one hundred and twenty feet long and about forty feet wide; and the pattern shop is large and fireproof. Besides these, the firm have probably the most complete boiler-shop in the State of New Jersey. It is two hundred feet long, sixty feet wide, and occupies nearly thirty city lots.

"About twenty-five years ago the senior partner, Joseph C. Todd, commenced in Paterson the manufacture of machines for spinning Manilla, Russia, and other hems into rope and cordage. The firm was originally Todd & Mackey, which



J. C. Gould

continued until 1848, when it was dissolved and Philip Rafferty became a partner. The machines made by them were improved from time to time, until now, it is believed, they are without a rival in the world. A set consisting of one scutching machine, one lapper, two drawings, and ten spindles, will spin twelve hundred and fifty pounds of No. 20 yarn per day, and the product is more uniform in quality and stronger than hand-spun rope. A set of these machines may be put up and operated in a room of thirty by forty-five feet, and the whole can be driven by an engine of ten horse-power. These machines have superseded all others heretofore used in the United States and Canada, and have been adopted in the Government Rope Works at Boston. In 1859 Mr. Todd visited Europe, and, notwithstanding the difficulties and obstacles thrown in the way of introducing American machinery in the European market, achieved a decided triumph, having secured their introduction into nearly all the principal rope manufactories of England, Scotland and Ireland.

"Messrs. Todd & Rafferty have recently perfected a machine for converting tow into bale rope in one operation, and have prepared improved machinery for picking oakum, which is in use at the United States Navy Yard, Brooklyn, and at all the principal manufactories in the United States and in England. Besides this class of machinery, the firm have attained an excellent reputation for building steam-engines and boilers. Their boiler works, as we have stated, are large and unusually well arranged. The horizontal steam-engines manufactured by them are notable for their simplicity, strength and superior workmanship. The cylinder is cast with a jacket which prevents the condensation of steam, and the pistons are self-adjusting. These engines are supplied with the Judson or Snow patent governor and valve.

"About three hundred and fifty hands are generally employed in these works, and sometimes as many as five hundred."

After the death of Mr. Rafferty, which occurred in 1873, a stock company was formed for the further prosecution of the manufacture, under a lease from the receiver, with the following members: Joseph C. Todd, Samuel Smith, James H. Todd, William Pennington, Michael A. Harold. The last-named represented the Rafferty interest. The name adopted at this time was "The J. C. Todd Machine Company." At this period 300 hands were employed. The plant consisted in part of 50 lathes, 125 vises, nine planing machines, one slotter, and 15 upright drills, with all accompanying tools. Neither the plant nor the buildings have greatly changed since that date, though there have been numerous improvements.

About five years ago the company failed, the affairs of the concern were taken to the Court of Chancery for adjustment, a receiver, Robert S. Hughes, was appointed, and all operations were suspended for a time. After about eighteen months of idleness the machine-making department proper of the works was leased from the receiver by Joseph C. Todd and the boiler-making branch by Samuel Smith, and both were put in operation, there being at present no connection between them. Since that period business has been fully resumed, and the outlook was never more flattering than at the close of 1881. Exclusive water rights give a great advantage to the machine works, especially in a time of drought. Besides the flax, silk and rope machinery made here, there are many specialties produced, including the Baxter portable engine, from two-and-half to four horse-power, for all manner of light manufacturing, the running of pleasure yachts, etc. Of these engines two per day can be completed. It has come to be conceded that "Todd can build anything," a

remark that is often made in speaking of the capacity and resources of the establishment under the management of the veteran machinist, Joseph C. Todd.

SAMUEL SMITH'S BOILER WORKS.

Samuel Smith is a pioneer manufacturer. In 1841, in copartnership with Abram Collier, he started a foundry; in 1843, in company with three others, he established a machine shop in the Franklin Mill; he was one of the founders, in 1847-8, of the locomotive works of Swinburne, Smith & Co., afterward incorporated as "The New Jersey Locomotive and Machine Company," of which Mr. Smith was Vice-President; later he assisted in founding the "Empire Manufacturing Company," and was also a prominent member of the firm of Rafferty, Smith & Co. and its successors. For several years he has been carrying on a large business in boiler-making on Railroad avenue, occupying the extensive works, covering thirty city lots, formerly consolidated with the establishment of the Todd & Rafferty Machine Company. Mr. Smith's career as a manufacturer has been marked by great successes alternated with almost crushing reverses. On three several occasions of disaster his losses were, in round figures, \$100,000, \$15,000 and \$30,000, not to mention many minor strokes of adverse fortune, such as all pioneers in great enterprises have been heir to. But he has withstood all, refusing to acknowledge defeat, and is still prosecuting his business as sturdily and persistently as in the commencement, some forty years or more ago. It is to such men as this, whose native force and indomitable energy no reverses can destroy, that Paterson owes its present proud position among the first of American industrial cities.

Mr. Smith is doing a very large and successful business in making locomotive, stationary and other boilers, receiving many orders therefor from Paterson and other locomotive shops; also, all kinds of tanks and other kindred products. One of the specialties of the works is the "Elvin boiler," the invention of Alderman Andrew Elvin, who has an extensive chemical factory at Riverside. The chief peculiarity of this boiler is that the tubes, or flues, of which there are a great many, are vertical instead of horizontal, the water passing through them, which causes a very rapid generation of steam and a great economy in fuel. The powerful boilers at the Weidmann Dye Works are of this description and were the first made under the patent. A thirty horse-power engine supplies the power at the boiler-works. From 100 to 120 men are employed, and the fortnightly disbursement in wages is \$2,000 to \$2,500.

THE WATSON MANUFACTURING COMPANY.

William G. and James Watson commenced making machinery in the old "Red," or Franklin, Mill, April 13th, 1845. At first only ten men were employed, the plant consisting of but three lathes, four vises and some minor tools. The fortnightly pay-roll at this time was from \$150 to \$200. After two years' occupancy the Watsons removed to the "Henry Clay," or Nightingale, Mill in 1847, where they remained thirteen years, when they established themselves in Railroad avenue, at the corner of Grand street, their present location. Here they purchased thirteen city lots and built extensive works of brick.

One year before this last removal seventy hands were employed and the firm had just enlarged their facilities by the erection of a new foundry. The business at the Nightingale Mill was mainly tool-making, millwrighting and general jobbing. The firm was very successful during these years, their products being sent to all parts of this country, to Mexico, South America and other foreign states. About 1858 a pair of bevel wheels, nine feet in diameter, with four inches pitch, eighteen inches face, and weighing seven tons, were made for Higgins' carpet factory in New York, and attracted no little notice. A large Corliss steam-engine and many turbine wheels also were built by the Watsons about this time.

Soon after the establishment of the firm on Railroad avenue 250 hands were employed. In 1865 the Watson Manufacturing Company was incorporated. In 1873 the climax of successful manufacture was reached, the company employing 1,100 hands, to whom was paid an aggregate of from \$11,000 to \$12,000 in wages fortnightly; the equipment of the extensive works was valued at \$90,000; the finished product amounted to from \$800,000 to \$1,000,000 per annum. At this date, when the entire works were in full operation, the Watson Manufacturing Company was one of the first industrial establishments in the country. They had largely abandoned millwrighting and jobbing, and were engaged in bridge-building almost exclusively, their product in this line having become famous the country over. Among the enduring monuments of their bridge productions is that magnificent structure, the iron bridge across the ravine on the Wallkill Valley Railroad at Rosendale, N. Y., a stupendous work.

The premises occupied in those more prosperous days consisted of a centre building, 50x75 feet, four stories high, used as a machine shop and for drawing rooms and offices; a foundry, 200x75 feet, one story; an L, 200x75 feet, three stories, two of which were occupied in making machinery and the third or top floor by E. J. Watson & Co., silk manufacturers. There was, beside, a pattern house, 100x50 feet, three stories, in which was stored an immense number of valuable patterns, afterward mostly destroyed in the fire of 1875; a blacksmith shop, 50x150 feet; an engine and boiler house, 30x75 feet; upper bridge shop, 200x75 feet; also various other smaller buildings, the whole constituting a considerable industrial village, full of the cheerful bustle and sound of remunerative labor. Over 200 men were employed in the bridge works alone. Two lots of ground were enclosed for fitting together and setting up completed bridges before shipping them to their destination, whither they were accompanied, no matter how great the distance, by skilled workmen to erect them in their places.

In October, 1872, the works were partially destroyed by fire, but they were speedily rebuilt, and there was little interruption to the manufacture. A still more disastrous fire occurred June 28th, 1875, which laid the greater part of the vast establishment in ruins. The company, which had met with some severe reverses in business about that time, became financially embarrassed soon after the last fire, a failure resulted, and a receiver, Watts Cooke, President of the Passaic Rolling Mill Company, was appointed. All operations were suspended for a time. The property passed into the hands of the First National Bank of Paterson, a chief creditor of the company, and was afterward sold to the Barbour Twine Company, the present owners.

From beneath this cloud the undaunted men who had witnessed the accumulation of a thirty years' struggle largely swept away, without one thought of surrender, after a time emerged, and a portion of the works was leased, and again the busy hum and the sharp sound of iron smiting iron was heard on the old industrial battle-ground. One floor of the largest building was occupied, giving space 200x56 feet; from eighty to one hundred men were employed, to whom were paid about \$1,500 fortnightly in wages; the value of the annual product was from \$60,000 to \$70,000; fifteen horse-power was used; the equipment was valued at from \$10,000 to \$12,000. The chief products were machinery and mill-gearing of all kinds. Since that date the status has not greatly changed, though there have been additions made both to the equipment and to the force employed. The product also is greater and more varied, the building of small steam-engines and bridge work having been added, and this phoenix-like company gives promise of attaining to nearly or quite its former prosperity in the not distant future.

JAMES JACKSON'S MACHINE WORKS.

James Jackson has made a great success of manufacturing looms, Jacquard machines, compass-boards, warping-mills, power-beamers, flyers, battons and all manner of weavers' goods, at Nos. 18 and 20 Albion avenue, where he has a very complete shop, well fitted up and furnished with a twelve horse-power engine. Mr. Jackson began first in Sherman avenue, in 1873, remained there four years, and then built a shop, 30x22 feet, two-and-a-half stories, in his present location, turning out, after being fairly established, eight to nine machines weekly. Soon after he was compelled by his increasing business to build an addition, making his shop 60x22 feet, after which he turned out about fifteen machines a week, employing twenty hands. He has since built a still further addition to his space, which gives him a shop 90x22 feet, two-and-a-half stories rear and three-and-a-half in front. His hands also have been increased, about \$10,000 being disbursed yearly in wages, and his motive power doubled, so that he can turn out 30 to 35 machines a week. The place is a model of neatness, and everything about the premises bears the marks of great prosperity. Mr. Jackson has shown remarkable ingenuity in the construction of special tools and machinery required in his business. He is held to be among the best builders of Jacquard machines in the country. Formerly all these machines were imported; now very few, if any, are purchased from abroad. The imported machines were very complex and difficult to manage. Mr. Jackson, while retaining every principle that had made the Jacquard incomparable since it was invented by the famous Frenchman, has pruned off the useless and troublesome parts, simplified its construction, given it extra strength and made it in every way more desirable for the purpose of American manufacturers.

The boiler, repairing and blacksmithing shops of the establishment are on the first floor; the second floor is the machine shop proper, and here the work of construction goes forward, and the third floor is used as a factory for making compass-boards, cylinders for Jacquards, looms and general wood-working. The business is firmly established and on an excellent basis. Mr. Jackson is a genial gentleman,

and has been honored by his fellow citizens with the position of Alderman, representing the Second Ward, in which he resides, with great ability.

BENJAMIN BUCKLEY & Co.

As noted in the foregoing sketches of the establishment of early machinists, the firm of Anderson & Buckley began the business of manufacturing spindles, flyers, etc., in the rear of the Nightingale Mill in 1844, when about six hands were employed. Two years later the firm moved to the Todd & Rafferty Works, where thirteen hands were employed. In 1847 they occupied a portion of the old Hamilton Mill, about which time Mr. Anderson died and one Hathaway was admitted to a partnership. Subsequently Mr. Hathaway retired and Mr. Buckley continued in the business alone, remaining in the Hamilton Mill about seventeen years in all, and doing a very successful business, employing from fifteen to twenty hands. About 1863-4 the business was removed to the present location, in the Gun Mill, where the manufacture has been prosecuted for the space of nearly or quite eighteen years.

Here the space occupied consists in part of a main room, 80x40 feet, and a blacksmith shop, 30x25 feet. The capacity of the concern is equal to a production amounting to \$75,000 per annum, though the actual out-put does not reach that figure. From twenty to twenty-five hands are employed; the annual disbursement for wages aggregates from \$8,000 to \$9,000. The product includes spindles, flyers, rings, tubes, caps, etc., for cotton, silk, flax, woolen and worsted machinery. The water-power used is rated at ten-horse.

The members of the present firm are Benjamin Buckley, William J. Buckley, John Townley and Joseph Buckley. The senior member of the firm, who is a staunch Republican, has been honored by his fellow citizens with the office of State Senator and also with that of Mayor of the city, to which latter he was several times re-elected; his great ability as an executive officer being recognized and appreciated by citizens of all political faiths.

BENJAMIN EASTWOOD'S MACHINE WORKS.

One of the most complete and among the largest establishments for the manufacture of the various machines used in the silk industry is that of Benjamin Eastwood, which has been in successful operation for ten years. Mr. Eastwood began to manufacture in Van Houten street, in 1872, on a capital of \$1,500, employing but three hands. In 1874 he removed to the Beaver Mill, where he employed twelve hands, his business steadily increasing. In 1878 he purchased a site on Ramapo avenue, near the Erie Railway station, where he built his present commodious works, worth from \$20,000 to \$25,000. The buildings consist of a machine shop, three stories high, 35x100 feet, and a smithy and foundry, 35x80 feet. From fifty to sixty hands are employed, according to the demands of business. The works are run and heated by steam, and conducted with promptness and system. The productions of this machine shop comprise the latest patents and valuable improvements in silk machinery, the principal of which may be enumerated as follows: Winders, doublers, drawside-frames, French, English and American quilling and spooling-frames, ribbon blocking machines, power and hand warpers, beamers and cleaners,

gros-grain and dress goods power and hand-loomis, Eastwood's new traverse motion, patented March 25, 1879, shafting, pulleys, hangers, etc.

The aim of Mr. Eastwood has always been to be the first to bring out anything in his line really meritorious. He keeps pace with all the inventions and improvements of the day, and his works contain a great deal of new machinery. He was the first to introduce steam-warping machines, and has made a great success of them as they at once met with the approval of manufacturers. He furnishes castings for outside parties and does a large amount of repairing. The value of the product is from \$50,000 to \$75,000 per annum.

EUGENE BEGGS, MACHINIST.

Eugene Beggs, who in 1871 commenced the manufacture of miniature locomotives and other specialties, has a neat establishment in Division street, Eastside. He began business at No. 50 Broadway, and removed thence to 220 Tyler street in 1874. From thence he removed to his present location. Mr. Beggs is very ingenious and has invented many valuable improvements in various departments of machinery. He is the patentee of the miniature locomotive, and also, with Aaron Pennington, the file maker, of the "Perfection" lawn and garden sprinkler, patented April 30th, 1878, one of the most popular tools of its class in the market. Many of these sprinklers are shipped to San Francisco and other distant cities. The capacity of the works is ten to twelve gross per month of the sprinklers, besides all other productions. The "baby engines" turned out by Mr. Beggs are the admiration of all and the especial delight of small boys about the Christmas holidays. This is the season when the production is greatest. The little engines, with two cars attached, not only are sold for \$10 a "train" and are a "joy forever" to the happy recipient, as he naturally gets the "rolling stock" and motive power but also the track to run his "train" on—a complete railroad and equipment—the track being a circle. Great speed is attained, and the toy is deservedly popular. The steam is generated by using alcohol. There is not another toy like it produced anywhere, and orders come from all parts of the country. Two rooms, each 15x25 feet, are occupied by Mr. Beggs, whose product is not confined to the articles enumerated. He is ready to undertake any task requiring unusual mechanical skill and inventive genius. A three horse-power engine is used.

ROBERT McCULLOCH, BRASS WORKER AND COPPERSMITH.

The working in sheet-brass and copper has always been an important industry in Paterson, especially as an adjunct to machine-making. This branch has steadily kept pace with locomotive-building as an important accessory. Horatio Moses, William Cundell, Robert Hayes and Nathaniel Lane, already alluded to, were pioneers in this department and for many years supplied the locomotive shops with copper tubes for boilers, brass domes, cylinder heads, jackets, etc. Among the most notable successors of these men is ex-Alderman Robert McCulloch, who occupies the same shop, at the sign of the brass dog with a tea-kettle in his mouth, that was started by Horatio Moses at least a half-century ago. Mr. McCulloch first began here in 1855, furnishing all kinds of brass, copper and tin work for locomotive-builders, machinists and others. He has been very successful. The premises

consist in part of a machine shop, 40x20 feet; a large building 80x20 feet, three stories, the lower portion occupied for copper and brass work, boiler and engine rooms, etc. In the upper portion of this building, and in an adjoining one, 160x40 feet in extent, the manufacture of spun silk, from mill and other waste, is carried on, Mr. McCulloch being interested in this enterprise also. All the brass moulding for the McCulloch works is done by Robert Taylor, in Prospect street. About 25 to 30 hands are employed.

THE McNAB & HARLIN MANUFACTURING COMPANY.

Brass casting and finishing became a distinct business first about 1855. In 1854 McNab, Carr & Harlin, having obtained a patent for a valuable improvement in globe valves and gauge cocks, began to manufacture in New York. Soon after they came to Paterson and started in Ward street, opposite Hamil & Booth's silk mill. Later the extensive brick buildings now occupied on Straight street, were erected. This factory was from the first driven by steam-power, not nearly so common then as now, and all descriptions of brass work was done. In 1859 forty men were employed at the new works. Patent alarm bells for boilers were always a specialty. These not only sound the note of danger when the water becomes inadequate, but forces it into the boiler. Adam Carr subsequently retired from the firm, a reorganization was effected and the business was continued by the "McNab & Harlin Manufacturing Company." The full complement of hands at the works is about 175, but not more than from 125 to 150 are employed usually. The firm were very successful in keeping their business in operation, and about the usual force employed, during the panic. The great variety of product here may be inferred from the fact that more than 25,000 patterns are required in the business.

CHRISTIAN KOHLHAAS, LOOM BUILDER.

Christian Kohlhaas is among the first silk loom-builders in Paterson and has shown wonderful ingenuity in the construction of these delicate products of the mechanic's art. There is nothing in this department with which Mr. Kohlhaas is not perfectly familiar, and he has made many valuable improvements in cotton, silk and other machinery. One of the greatest achievements of his genius was the production of a loom that wove by a continuous motion canvas army and sportsmen's belts, with cartridge pockets all complete, vastly superior to any leather belt and costing not half as much. But through the unscrupulous conduct of others, with whom he was connected, which need only be alluded to here, the inventor lost all the fruits of his outlay in brain and money.

Mr. Kohlhaas began business first in a portion of the Franklin Mill, in 1863, and remained there ten years, employing but six hands, the work being mainly jobbing. The mill burned down twice while Mr. Kohlhaas occupied space there, and each time all his plans and tools were destroyed; but each time he arose from the ashes, took courage and commenced all over again. In 1873, when he removed to the old "Duck Mill," he was employing ten men, and a little later fifteen, and was turning out three looms each fortnight. From this location Mr. Kohlhaas removed to the rear building of the Gun Mill group, and thence into the Gun Mill proper, where he has been prosecuting the business during the past five or six years, em-

ploying twenty to thirty hands and building about three finished looms per week. Formerly only plain goods looms were made at this shop, but since 1878 looms for figured goods, brocades and all the more elaborate fabrics are among the productions.

J. NUSSEY & Co.

In 1865 Watson & Nussey began the manufacture of flax, jute and silk machinery, in a very small way, in a building in the rear of the Nightingale Mill. Joseph Nussey, an accomplished machinist, came to this country from Yorkshire, England, in 1862, through an engagement with J. C. Todd, of the then Todd & Rafferty Machine Company. After remaining with the company for two-and-a-half years he associated himself in the business of machine-building with Samuel Watson. Messrs. Watson & Nussey dissolved partnership in 1870, when Mr. Nussey together with John H. Remig organized the firm of J. Nussey & Co. The same year the business was removed to the shop just vacated by the "Industrial Works," in the Nightingale Mill proper. At first the firm occupied it under a lease but subsequently purchased the property.

Machinery of every description for the manufacture of flax, hemp and jute is made here, the concern having a reputation that reaches the country over, its productions being in operation in every State in the Union where flax is grown and jute and flax manufactured. The firm has a wide renown for the production of silk machinery also, their silk power-looms being especially popular with manufacturers. This establishment was among the first in the country to produce silk power-looms, and it has fully maintained its standing in this regard, the machinery turned out being marked by a smoothness of operation and perfection of finish, showing careful regard to detail, not attained save by machinists of great experience. The premises occupied consist of a machine shop, 100x40 feet, three stories, with a foundry and smithy attached. From forty to fifty hands are employed. The concern is vigorous and the business steadily increasing under the energetic management of Mr. Nussey, who supervises personally all the details of manufacture.

ROBERT ATHERTON, GENERAL MACHINIST.

Robert Atherton, late Superintendent for the Van Riper Manufacturing Company, from its formation, being himself one of the incorporators and a stockholder, commenced business in the Fall of 1878 in the rear of the Franklin Mill, as a builder of silk machinery and general machinist. In 1880 he removed to his present location, at the entrance to the Gun Mill yard. He makes a specialty of quill-winders and spinning frames, embodying several valuable patents for improved spindles—one of which outrivals the celebrated "Atwood spindle"—and attachments to quill-winding machines. The shop occupied is 50x50 feet, two stories; number of hands employed, 25; annual disbursement for wages, \$6,000.

BALDWIN TAYLOR, BRASS FOUNDER, ETC.

Baldwin Taylor began the business of brass-founding in the "Bachmann," or Hamilton, Mill in 1871. After two years he removed to his present location, at the foot of Prospect street, where he has a shop well fitted for the prosecution of brass-

moulding in all its departments and jobbing in brass, confining himself mainly to working in that metal. He uses from twenty-five to thirty boxes for moulding purposes, and the shop is fully equipped and the business prosperous.

BENJAMIN HILTON, BRASS FOUNDER, ETC.

Benjamin Hilton has a well-appointed shop in Vine street, 40x60 feet, where he does a general business as brass and iron moulder for machinists; he also does casting for the Paterson Iron Works, the Passaic Rolling Mill, the Midland Railway shop and others, furnishing brass bearings, etc., besides doing a large jobbing business. About a dozen men are employed, and the establishment is vigorous and rapidly growing. Mr. Hilton at the close of 1881 was about to build a machine shop in connection, 25x80 feet, two stories.

JOSHUA MASON, MACHINIST. — "THE SUCCESS" HOT WATER HEATING APPARATUS.

Though it is a fact that of late years Joshua Mason has not been engaged in machine-making, properly so-called, he may justly be classed among the most eminent of the pioneer machinists of Paterson. It has already been noted that John E. Van Winkle began as early as 1849 to make machinists' and engineers' tools, and that long afterward Mr. Van Winkle and Mr. Mason were associated in business as machinists, occupying what was long known as "the old Van Winkle shop," adjoining the Phoenix Mill. The shop was burned in 1875, was afterward rebuilt and incorporated with the Phoenix Mill premises. The firm of Van Winkle & Mason was dissolved after the fire, Mr. Van Winkle retiring from business and Mr. Mason establishing himself in a small shop in the rear of the Gun Mill lot. Henry Van Winkle, a son of the senior member of the old firm, became the very efficient superintendent of the rebuilt Van Winkle shop for its new owners, the Phoenix Manufacturing Company. After his removal to the Gun Mill shop Mr. Mason spent several years in perfecting a radiator for steam-heating, of his own invention, and of this he made a great success. The "Mason Radiator" has become widely known and has been introduced into many of the great public buildings in New York city and elsewhere throughout the country. It has come to be regarded as one of the most perfect radiators known.

Mr. Mason's latest achievement, however, eclipses all that preceded it, being an entirely new system of heating buildings by a continuous circulation of hot water in pipes, a method that has many and great advantages, combining a wonderful economy with equally wonderful effectiveness, and it appears not unlikely that the new invention will in time revolutionize the present systems of heating interiors. Mr. Mason employs but few hands, his valuable inventions standing him in better stead than a much greater production of more ordinary machinery. Garret D. Voorhis, the well-known sheet-iron, copper and tin worker, at No. 9 Fair street, has secured absolute and exclusive rights in the new heating apparatus for a term of years and is engaged in the business of introducing it. It is manufactured by Messrs. Mason and Voorhis conjointly. Though it has not as yet been fully brought before the public, it has met with great favor wherever tested, and the name given

the new apparatus, "The Success," was most probably attached to it through an inspiration that will prove to have been prophetic.

T. C. SIMONTON & Co., MINING MACHINERY, ETC.

T. C. Simonton, at one time senior member of the firm of T. C. Simonton & Co., who erected the buildings at the corner of Paterson and Ellison streets and commenced building steam fire-engines in 1853, the first enterprise of the kind ever attempted in Paterson, is now operating a considerable foundry and machine shop on Washington avenue. This foundry was first erected in 1872 by Stewart & Morrell as an adjunct of the Whitney Sewing Machine Company's Works, but it suffered with the fortunes of that concern, operations were discontinued and the property was afterward owned by Scott & Fairbanks. From them the plant and appurtenances were purchased in the Spring of 1876 by Mr. Simonton, who had not engaged in manufacturing since about 1860, when the Steam Fire Engine Works were closed. He associated with himself Thomas Connell and Jonathan Lord, two practical machinists with a thorough knowledge of the peculiar machinery used in gold-mining. The real property was purchased of Scott & Fairbanks by James Angus, and the present occupants hold it under lease.

The firm have received large orders for gold-mining machinery through a relative of the senior partner, James W. Simonton, well known throughout the country through his connection with the Associated Press, who is president of a gold-mining company. The machines turned out here are mainly washers and sifters, the use of which has succeeded, save with the most primitive diggers for the precious metal, the old-time and laborious method of pan-washing. The castings and some of the parts are made at the Washington avenue foundry, where a considerable number of men are employed, the force varying with the demands of the business; the other parts are made for the firm at different machine shops about the city. The value of each completed machine is about \$3,500; the weight seven-and-a-half tons. A large number of these machines are turned out yearly.

THOMAS WRIGLEY, MACHINIST.

About 1848 Thomas and John Wrigley, brothers, established themselves in a shop on the Todd & Rafferty property and engaged in the manufacture of washers, chains, comb-plates, card-teeth, etc. The premises had been occupied as a cotton factory by Mr. Stark. The plant of the Wrigley Brothers embraced four power and three hand presses; about \$1,500 was invested and six men were employed. In 1849 the firm occupied the old "Button Mill." In 1851 they removed to the Todd & Rafferty building on the Holsman property. In 1859 John Wrigley sold his interest in the business to his brother Thomas and a gentleman named Nichols, who for years had been in charge of the silk-spinning department for Salter & Cutter, and the style of the firm was Wrigley & Nichols until 1865, when Mr. Wrigley purchased Mr. Nichols' interest and became sole proprietor. Meantime, about 1864, the business had been removed to Railroad avenue, where, in 1866, the building of silk machinery of various kinds was begun. This branch has for the past fifteen years been increasing in importance, and the well-equipped establishment, containing

many special tools and patterns, has come to be regarded as one to which nothing is impossible in the department of machinery. The manipulation of silk, cotton, flax, jute, iron, all the fibres and all the metals, is greatly assisted by the ingenious machinery constructed under the personal supervision of this veteran machinist, many of the productions being specialties. In 1873 twenty-four men were employed and \$18,000 invested. After remaining about seventeen years in Railroad avenue, Mr. Wrigley, in 1880, sold his property there to the Barbour Twine Company and purchased an eligible site for a new works at the corner of Vine and Essex streets, where he is now located and continuing the prosperous business of the past years. The premises occupied are in size 30x75 feet, two stories. Eighteen to twenty men are employed. The disbursement for wages was \$5,129 in 1879, \$8,604 in 1880, \$8,720 in 1881. An eighteen horse-power engine is used to drive the machinery. Among the specialties produced here is the patent spindle run by a conical leather washer, without a belt. This is one of the most ingenious contrivances possible; the speed attained is from 8,000 to 10,000 revolutions a minute.

JOHN WRIGLEY & SON, GENERAL MACHINISTS.

John Wrigley, after separating from the firm of T. & J. Wrigley in 1859, established himself at the Broomhead Mill, by the West street bridge, where he remained, prosecuting the business of general machinist, until 1880, when he removed to No. 20 Madison street. Some years ago the firm was strengthened by an infusion of young blood, a son of the veteran machinist being admitted. When the start was made at the Broomhead Mill but two hands were employed, and the equipment was small. During the panic Mr. Wrigley's business was at a very low ebb. Afterward it became prosperous, and about fifteen hands were kept constantly employed at new work and in repairing. The firm have an enviable reputation as machinists and are increasing their facilities by adding to their tools and equipment from time to time. In 1874 the manufacture of Jacquard machines was commenced, and this branch has since become a very important one. At first these machines were made of wood, but of late years iron is used. John Wrigley & Son employ a four horse-power engine in driving the machinery, and occupy space equivalent to 75x25 feet, two stories.

JOHN ROYLE & SONS, GENERAL AND SPECIAL MACHINISTS.

This firm is located at No. 62 Railroad avenue in the Barnert building. John Royle, the senior partner, in 1860 commenced business as a general machinist in Water street, occupying a portion of the wood-type factory owned by the late Darius Wells. The beginning was on a very limited scale. By energetic and careful management the business expanded until in 1876 Mr. Royle admitted a younger son, John Royle, Jr., into partnership, the style of the firm thereafter being "John Royle & Son." The year of 1879 found the establishment increasingly prosperous. At this date Vernon Royle, the eldest son of the original founder, was admitted to a partnership, and the name of the firm was changed to "John Royle & Sons," which it still retains. In February, 1881, the business was removed from Water street to the above named location, where the operative force was increased to twenty hands, and the prosperity of former years was continued.

So thoroughly is the skill of the eminent machinist at the head of this establishment understood and recognized, and so ample are the resources of brain and equipment, that inventors, manufacturers and others have learned to apply with confidence to the Messrs. Royle when they want a difficult piece of mechanism produced—in very many instances invented as well as made. The firm bring the highest skill as well as the brightest intelligence to bear on their largely difficult productions. They seem fully to realize that the day of brute force in the machine-shop has gone by; that the operations therein of to-day are more of the brain than of the muscle; that since some one must furnish the brain work it is a pertinent question for the individual machinist whether he shall educate himself to supply the larger part of it and get paid therefor, or whether, on the other hand, he shall put himself nearer on a level with the machine he operates and allow some one else to get paid for the thinking. This is a matter every American mechanic has to settle for himself.

The specialties in machinery built at this establishment are numerous and important. Among them may be noted the straight-line routing machine, for making wood type, adapted also to engravers' and joiners' use, and to show-card and label work, etc. The machine is the invention originally of Darius Wells, of Paterson, but John Royle & Sons have so greatly improved the original, adding to its scope and adaptability, that several patents have been secured in the firm's name. The radial-arm routing machine, for the use of electrotypers, wood engravers and others, possesses all the excellent features of the straight-line machine, except that it is not especially adapted to cutting straight lines. Another specialty is a facing-lathe designed for turning or facing the blocks used for mounting electrotypes, stereotypes, zinc or other metal plates, etc. Another is an exquisitely perfect circular sawing-machine, for fine and accurate sawing. Still another specialty is the improved piano card-cutting machine for Jacquard cards, an invention pre-eminently valuable in a silk centre like Paterson. Among the notable features of this machine are a card-guide, universal and self-operative to any width of card; long pistons with bearings on the upper and lower rails of the front leg, thus securing perfect rigidity to the punch-head; a cutting pedal connected direct with the punch-head; a cutting lever with an adjustable fulcrum, by changing which the machine may be made more or less powerful; an adjustable stop to the pedals, by changing which the shortest possible "tread" may be secured; perfectly accurate vertical adjustment of the punch-head, by means of a right and left screw; also other recognized improvements on the ordinary card-cutting machine. The machine is built almost entirely of iron, thus securing great rigidity, the advantage of which will readily be understood by card-cutters. Its range is from a one-hundred to a nine-hundred Jacquard.

In addition to the production of specialties the firm does a general machine business, undertaking all the most intricate and difficult mechanical problems brought to them. They manufacture the peculiar machine for making rubber tubing and insulating wire and for other purposes, the invention of T. C. Simonton, of Paterson, also power-warpers, and other silk machinery, and a great variety of light work.

THE VAN RIPER MANUFACTURING COMPANY.

The works of this company are located at Nos. 13 and 14 Van Houten street. The officers are George P. Van Riper, President, and William J. Atkinson, Secretary. The product is bobbins, belting, silk-machinery, etc. The establishment has grown from a very small germ planted in Paterson about sixty years ago, in 1820, by Thomas Van Riper, who first commenced the business of bobbin and spool turning in 1795 on Peckman's creek, whence he removed to Paterson twenty-five years later. Peter V. H. Van Riper, a son of the above-named, succeeded to the business in 1834 and added the manufacture of leather belting about 1850. During the lifetime of the elder Mr. Van Riper the turning of bobbins was done altogether with the gouge and chisel, by hand (what power was used for any such purpose in those days was, literally, horse-power, but his successor soon introduced such wood-turning machinery as came into use from time to time, as the growing necessities of the business demanded. July 1st, 1866, a son of the proprietor, George P. Van Riper, was admitted to a partnership, the firm being styled P. V. H. Van Riper & Son, which name continued unchanged until the death of the senior partner, October 1st, 1869, immediately after which a charter was obtained and the Van Riper Manufacturing Company was formed. The company have since that date prosecuted the enterprise with a flattering measure of success, under direction of the officers above-named, whose energy and experience have been impressed upon the business for many years past. About fifty hands are employed. The premises occupied consist of a frame building, 50x55 feet, four stories, with basement; a wing, 20x45 feet, two stories; also capacious storehouses and ample out-buildings.

The beltings and bobbins of this company are to be met with in almost every manufacturing town in the country where textile machinery is in use, and they have earned for the establishment a reputation which could only result from a thorough knowledge of the necessities to be met and a proportionate skill and experience in production. The remarkable finish, durability and general excellence of these goods have reflected additional honor on Paterson mechanics and are no discredit to a concern that represents the third generation in direct line from the original founder more than threescore years ago. Since the fire which occurred about 1875, destroying the bobbin factory of the company, the product has been more especially leather beltings and various kinds of silk machinery.

In addition to the establishments engaged in building machinery and in producing the various castings, etc., pertaining thereto, described on the foregoing pages, there are a number of other and smaller concerns which must not be entirely overlooked.

ROBERT TAYLOR, at 27 Prospect street, began in 1872 a business of jobbing in brass work of all kinds and brass casting, having earned an excellent reputation as a skilled mechanic. Mr. Taylor was formerly a foreman at the Grant Locomotive Works. He employs about twelve men.

ASHFIELD & EARLY have a small shop at No. 18 Mulberry street, in the rear, where they make bolts, nuts and rivets for machinists on orders. They have three small rooms, and employ two or three hands.

THOMAS JOHNSON, formerly employed by Joseph Archer, has a small machine shop on Mill street, where he commenced in 1879. He does repairing and jobbing and manufactures fire-escapes, ship-carpenters' knives, etc.

JOSEPH ARCHER has a small shop, similar in character to Thomas Johnson's, in Prospect street near Broadway, where he commenced operations in 1861. His business as general machinist and jobber is expanding, and he is increasing his facilities from time to time.

HENRY JONES, a "graduate" of the Phoenix Mill, employs from eight to ten men in making silk machinery on orders at 92 Prospect street, where he commenced in 1879. His business is prosperous.

W. H. HAVENS, at 132 Broadway, began in 1865 the manufacture of steam pumps, iron circular saw tables, cogged and mortise gearing, shafting, hanging pullies, etc. His business is, properly speaking, the construction of patterns and machinery, and in this he has the advantages of the best materials, superior tools and long experience. About ten hands are employed.

JAMES DUNKERLY & SON are carrying on a well established business as general machinists at No. 111 Spruce street, the senior member of the firm being one of the pioneers in this department of Paterson's industries. The concern has an excellent reputation for turning out the best class of work and as excelling greatly in certain specialties.

MARTIN SMITH is doing a considerable business in manufacturing silk and other machinery, and in jobbing and repairing, at Nos. 55 and 57 Van Houten street.

MESSENGER & DRINGER, the last-named the defendant in the famous Erie-Dringer litigation, which would have totally ruined a more vulnerable and a less determined man; also C. C. Van Houten, have belting factories on Van Houten street, and do a considerable business in the manufacture of leather belts and kindred productions, germane to the building and operation of machinery.





H. Beckwith

CHAPTER XXI.

THE IRON INDUSTRY. FORGES, ROLLING MILLS, ETC.

IN addition to the departments of locomotive-building and machinery, there is in Paterson a number of very important iron industries such as forges, rolling mills, foundries, and others, which may be classed as miscellaneous. Among the most extensive of these are the Passaic Rolling Mill, the Union Bolt Works and the works of the

PATERSON IRON COMPANY.

The business of this last-named establishment grew out of the demand existing about thirty years ago for axles, tires and shapes for locomotives and other heavy engine work. The company, which was chartered and began business in the Fall of 1852, was composed mainly, almost wholly, of New Hampshire capitalists, two of them, named Gillies, being cotton manufacturers. There was also a Mr. Dane, who was the first President, and a Mr. Tarbell, who was Secretary and Treasurer, both from New Hampshire. Sherman Jaqua, one of the most energetic and successful of Paterson's iron manufacturers of that period, was really at the head and front of the business and first Superintendent of the works.

In 1853 Franklin C. Beckwith, whose remarkable business talent, energy and ability were destined to be impressed on the future of the establishment for the space of about twenty years, purchased Mr. Tarbell's interest and soon advanced to the head of the business, which he directed until near the date of his death, in 1875.

Mr. Beckwith was a fair type of the enterprising and *capable* men of the period. He was born in the old town of Saratoga, Saratoga County, near Schuylerville, Northern New York, July 2nd, 1817, being one of the nine stalwart sons of Jedediah and Huldah (Coleman) Beckwith, well-to-do farming people. Franklin C. received only a common school education, working with his father on the farm until he attained the age of nineteen, when he left home to fill a position as foreman of construction on the Boston and Albany Railroad, on which line his elder brother was chief engineer and contractor. Afterward he, also, became a contractor on the same road, with headquarters at Chatham Four Corners, Columbia County. His next engagement was with the Troy and Albany Railway Company, who, recognis-

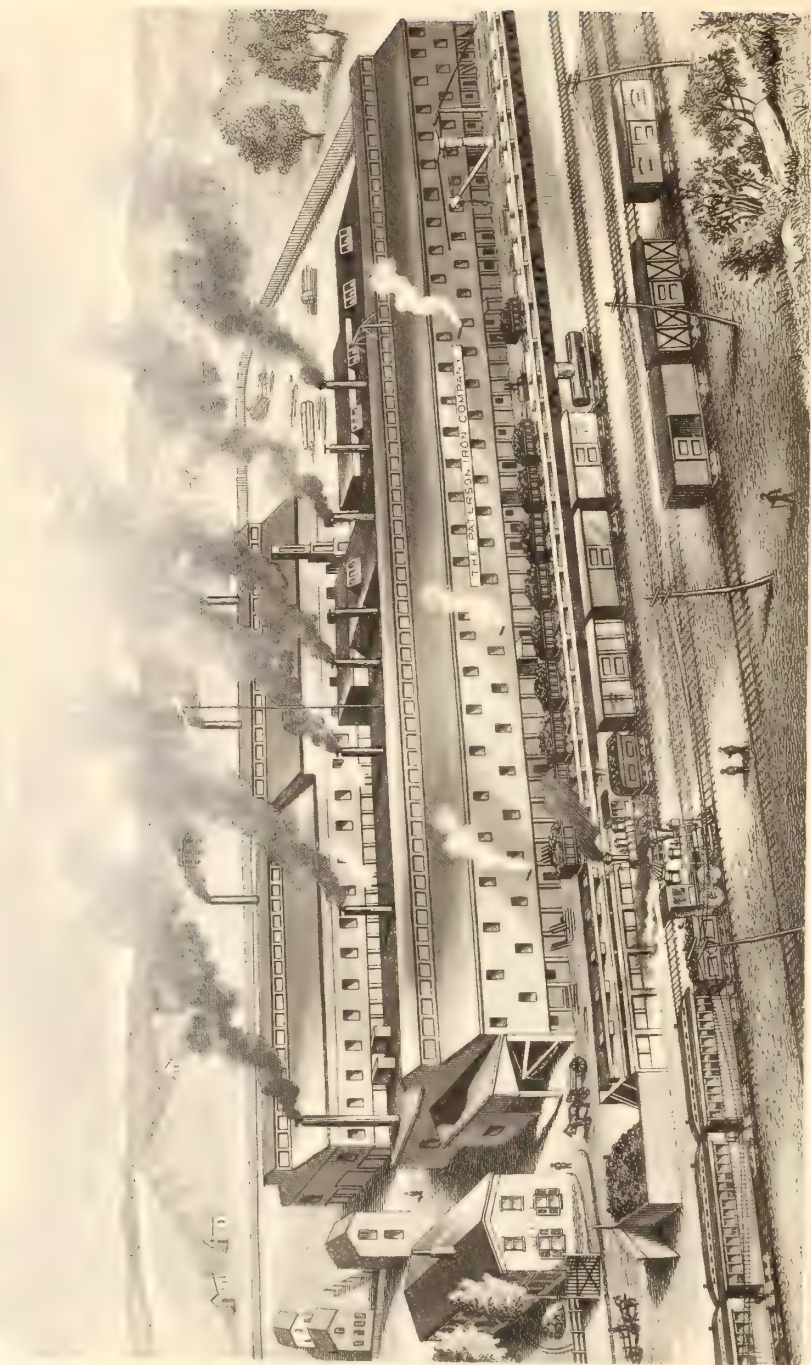
ing his ability, gave him the position of Superintendent of freight and tracks. At this time his residence was at Troy. About 1845 Mr. Beckwith engaged for a brief space in iron smelting in Pennsylvania. In 1850 he was principal contractor on the Delaware Division of the New York and Erie Railway and had a heavy contract for laying the track between Port Jervis and Susquehanna. He was afterward employed in laying the track of the road from Niagara Falls to Lockport, N. Y., with headquarters at the Suspension Bridge. After the old Paterson and Hudson River Railroad was absorbed by the New York and Erie Mr. Beckwith directed the laying of the double track between Paterson and Jersey City. He was also employed in building the great bridge at Susquehanna on the line of the New York and Erie Railway. This was about the last important work in which he was engaged before coming to Paterson to enter upon the iron manufacture, in 1853.

Mr. Beckwith never sought for nor would he accept any office in the city or other local government. He was "all business," so far as related to his secular pursuits. He was a consistent member of and regular attendant at the First Baptist Church and was first President of the Cedar Lawn Cemetery Company, of which corporation he was a founder. He married Esther A. Clark, a daughter of Thomas and Esther (Carmichael) Clark, of Easton, Washington County, N. Y., and the fruits of this union were three children, Charles D., Joseph A., and Julia Frances, the wife of John H. Hopper. The first-named, Charles Duvall Beckwith, succeeded his father in the direction of the vast industry the success of which he so greatly promoted, which responsible position the son still holds.

The production of the company has greatly changed since the date of its formation. Of late years locomotive builders have added hammers to their equipment and now make their own axles and shapes, and the old-time wrought iron tires have given place to steel. In consequence of these changes the Paterson Iron Company have of late years directed their attention more particularly to steamboat work and all manner of heavy forgings, in which they have done a very large business. Some of the most stupendous masses of manufactured iron, in the form of shafts for ocean steamers, and others, have been turned out at these works.

About 1857, during the panic of that period, Messrs. Jaqua and Beckwith purchased the entire balance of stock owned by the New Hampshire men, and in 1861 Mr. Beckwith purchased Mr. Jaqua's interest for \$20,000 cash. Mr. Jaqua soon after erected a portion of the original building afterward occupied by the Passaic Rolling Mill Company. Up to 1860 the Paterson Iron Company furnished nearly 7,000 tires and manufactured forgings for 1,700 locomotives. The works had facilities for turning out annually 1,800 tires and forgings in proportion. In the rolling of tires a machine had been invented by the Superintendent, Mr. Jaqua, which made them perfectly round and true, so that they required no boring before being put on the wheels. The number of men employed at this date was about 40; annual consumption of coal, 2,500 tons. The works were driven by an engine of forty horse-power and furnished with three powerful trip-hammers, two of them of Kirk's patent. Bishop's "History of American Manufactures" gives the following account at a later date, about 1868:

"The Paterson Iron Company's Works are located within a short distance from the depot of the Erie Railway. The company commenced operations by erecting a



forge, one hundred and thirty feet long by eighty-six feet wide ; a blacksmith and welding shop, seventy-five feet long by fifty feet wide, and a rolling shop, forty-three feet long and thirty-six feet wide. This shop is equipped with machinery by which the tire, after having been laid on a horizontal face plate, and run between a pair of running rolls and two guide rolls, is taken out so perfect as to require no boring or turning to fit the wheel centre.

"In 1855, having purchased the patent right for the State of New Jersey, they put in one of Watts' one thousand-pound steam hammers, and from that time until 1861 they were almost constantly employed in manufacturing locomotive forgings and tires for the locomotive shops in Paterson and Jersey City, and a large amount of repair and renewal work for the railroads in this vicinity.

"The entire machinery of the forge and tire mill is driven by an engine of seventy-five horse-power, built by William Burden, of Brooklyn. The machine-shop is driven by an engine of thirty horse-power, built by Todd & Rafferty, of Paterson, New Jersey.

"The strength and durability of the Paterson locomotives is no doubt due in no small degree to the skill and care of the managers of this establishment, and their reputation for superior workmanship has become so well established that they are called upon for forgings and tires from every State in the Union.

"The forge and machine shop is now four hundred and eighty feet long by eighty-six feet wide, the blacksmith and welding shop one hundred by fifty, and the tire rolling and bending shop eighty by thirty-six feet. There are thirteen heating furnaces, eight of Watts' patent steam hammers (six of one thousand and two of fifteen hundred pounds), two of Nasmyth's upright steam hammers (one of three and one of ten tons), eight lathes, five planers, two slotting machines, etc. They employ about two hundred men, and turn out from three thousand to four thousand tons of finished work per annum. A national reputation was achieved by the company several years ago already by their production of the "Marshall patent anchor," which received the full endorsement of skilled officers in both the government and merchant marine. A severe test made by a party of officers on the steam-tug *Warrior*, in Portland harbor, established the extraordinary holding power of this peculiar anchor, which weighed, in this instance, but 200 lbs. Small and light as it was it not only arrested the vessel when at full speed, and with a stiff breeze blowing, but held her fast when subjected to a pull from a steam-tug which, in the opinion of nautical men, would have dragged a thousand-pound anchor of the old form. Tests were made in Nova Scotia, in England and Ireland with like results. The only wonder is that this remarkable anchor has not been universally adopted."

The record for 1873 shows that the company turned out 1,600 tons of forgings that year, but soon after and during the panic the production was decreased, this establishment suffering in common with other industries of like character throughout the entire country. At the lowest ebb but 60 men were employed. But for the past few years the lost ground has been fully recovered, and this is now among the most thriving iron-working concerns in the country and with a reputation second to none for excellence of product and capacity to turn out the most difficult and ponderous forgings demanded by the marked advance in marine architecture. The equipment has been added to from time to time until the facilities of the works are unrivaled by any other of the same class in the United States. Fourteen steam hammers in all, several of them the most powerful used by any establishment of the kind (one, a marine hammer of twelve and another, of three tons, were added in 1881); four slotting machines, three of them extra heavy; five planers, eight lathes, two very large, besides boring and drilling machines, etc., are inclu-

ded in the equipment. The main building occupied is 530x90 feet ; a blacksmith shop and steel-casting wing is 125x75 feet ; there is a main blacksmith shop recently erected, 250x60 feet, besides which there are various minor buildings. The extreme length of the main group of buildings is nearly 700 feet. The out-put of the establishment for 1881 was 7,500,000 lbs, or 3,750 tons, of forgings, etc. About 200 men find constant employment ; at times many more. The amount disbursed for wages in 1881 exceeded \$150,000. The officers of the company are : Charles D. Beckwith, President and Treasurer ; J. A. Beckwith, Secretary ; James Johnston, Superintendent.

PASSAIC ROLLING MILL.

This is the most important as well as the most extensive establishment of its class East of the Alleghanys and among the largest in the country. It is the only concern of the kind in Paterson and has for many years been regarded, and justly, as one of the chief among the grand industries that have contributed to the growth and importance of the city. It may be well to glance briefly at a very early enterprise of this character before proceeding to a description of the works in question.

The most notable among the industries established at the beginning of the century was the Rolling Mill and Nail Factory, started by Samuel Colt, John Colt and Nicholas Delaplaine. The location was on the site of the present Gun Mill, the building being erected in 1811 and soon afterward put in full operation. The product was nails and sheet-iron work. Russia and Swedes iron was used, rolled into plates and cut up by machinery into nails without heads, which were then picked and headed by hand. There was machinery for drawing wire, also, in the basement and first floor of the building situated in the rear of the one afterward occupied by the Paterson Steam Fire-Engine Works. The company dissolved partnership in 1822, after about eleven years' successful operation, and thereafter the business was continued by John Colt until about 1826 or 1827, when, the price of nails having fallen below the price of the iron of which they were made, their manufacture was abandoned and the machinery taken out and sold for old iron. The late John Cooke remarks in his paper on "The Iron Industry of Paterson": "Could they have procured the low-priced iron of which nails are now made, and the improved nail machines of to-day, probably Paterson might now have had a nail factory among her other industries." It may be stated here as an interesting fact that John Colt, while still operating the works, rolled into sheets for the United States war steamer *Fulton* the copper ingots sent to him by the Government for that purpose.

The Passaic Rolling Mill Company are manufacturers of rolled iron and contractors and builders of iron road and railway bridges and similar structures. It is of great importance that a manufacturing centre should be able to supply quickly within itself the necessary material used in its various industries. Many of the stores, the mills and the machine shops of Paterson look to the Passaic Rolling Mill for their supplies of iron, to be resold or manipulated in their several departments.

It was in 1867 that the then idle property of the Idaho Iron Company, founded in 1861 by Sherman Jaqua, was bought by the firm of Cooke Brothers (John, Watts,





William and James) and altered into a mill to make ordinary bar iron. In 1869 a charter was obtained incorporating the Passaic Rolling Mill Company. In 1873 William Cooke retired from the company to engage in business in New York city, and W. O. Fayerweather purchased his interest and assumed the duties of Secretary and Treasurer. More land and buildings were afterward added until at the present time the business occupies about ten acres, five of which are under cover. From making ordinary bars only the product has increased in variety and now includes what is called structural iron, viz, beams, angles, tees and all the iron parts that enter into the construction of buildings, bridges and ships.

There are but five other concerns in the country making a similar line of products, and through the enterprise and marked ability of the management the trademark "Passaic" can be seen branded on iron in almost every portion of the land from Maine to California. In 1876 was added a new department, that of bridge-building. This feature was introduced at a time of extreme depression in all industries, the object being to enable the company to enter into contracts for the construction of the contemplated elevated railroads in New York city. They were successful in their endeavors, and from 1876 to 1880 they furnished thousands of tons of the material and thus aided in affording the people of New York city their much-needed and long-coveted rapid transit. This work gave full employment to over 600 men all through the hard times, the fortnightly disbursement for wages averaging \$10,000. In addition to the elevated work many bridges have been built for common highways and railways in the United States, South America and the West Indies.

The annual out-put of the mill has been raised from 2,000 tons in 1867 to 15,000 tons in 1881. This production requires about 25,000 tons of coal (anthracite from Pennsylvania and bituminous from Maryland), about 4,500 tons of iron ore from Lake Champlain and 15,000 tons of pig iron and much bar iron from the various furnaces in New Jersey and Pennsylvania. The raw material received and the finished product shipped give the railroads a total freightage of nearly 3,300 tons per month.

The various stages and operations in the course of manufacture can be understood much better when seen than through the most elaborate description. In fact no description, however graphic, can convey any adequate conception of the striking scene that may be witnessed in these vast buildings every night, save on Saturdays and on Sundays before 12 o'clock midnight. Above the heads of the workmen, from near the dimly-defined timbers of the smoke-begrimed roof, pours forth the dazzling brilliance of the many electric lights, flooding every object. Scattered about, in attendance on the different furnaces, appear groups of brawny Vulcans, stripped to the waist and displaying muscles and tendons standing out like cords and knots as they rush to and fro, handling the white hot balls of molten metal, which they trundle from the furnaces to the rolls on iron "buggies." Cannon-like detonations are heard as the immense masses of metal are subjected to the operations of the squeezers and hammers for the purpose of forcing out the slag and compressing the substance to a size for the rolls to receive and lengthen it; thundering reverberations follow, causing the solid building and even the ground for a considerable dis-

tance about to tremble, as the ponderous masses of iron are forced reluctantly through the rolls; showers of brilliant sparks scintillate as in a monster pyrotechnic display as the iron beams, columns or girders shaped in the rolls are sawn to the proper length with the same ease that a log of pine is sawn asunder with an ordinary saw. The combination of overpowering brilliancy from all the furnaces and the exposed masses of white hot metal as it is being hurried through the various processes at times pales even the intensity of the piercing electric light which illuminates all the departments. In the bridge-building department are seen the mighty punches and shears, perforating, clipping and shaping bars of solid metal as if they were merely bars of soap; also steam riveters driving rivets home with a rapidity and thoroughness mere hand-power could never accomplish. All these operations and many more are in progress by day and by night, relays of hands relieving each other, and all is done in the sole direction of converting the rough and uncouth "pig" to the requirements of modern architecture in bridges, houses, etc. Standing out in the darkness of the night and watching the movements within, amidst the thunder and the glare, and the ruddy light from the fires, and the showers of sparks, but little stretch of the imagination is required for one to fancy himself gazing into Dante's *Inferno*, or at least into a modern and modified "annex" thereto. The scene will never be forgotten by those who witness it, and the operations are equally fascinating to the curious and imaginative and to the common-sense and practical.

All the interior working of the establishment is under the direct supervision of the President of the company, Watts Cooke, who, brought up to the use and in the knowledge of tools, has added thereto great experience in the management of large bodies of men.

The large amount of material bought and sold, the manipulation of the finances, the proper and careful execution of contracts running over months of time and involving thousands of dollars in amount, falls under the management of the company's Treasurer, W. O. Fayerweather, a native of Paterson, educated theoretically in her public schools and practically in a New York importing house, where in six years he passed the intervening stages from errand boy to financial partner, always making his home in Paterson and being identified with its interests. The active control of the works, covering a yearly value of product of over a million of dollars, with an annual disbursement for wages amounting to nearly three hundred and fifty thousand dollars, is divided between these two gentlemen, who both take pride in making their establishment an honor and credit to the city in which it is located.

A feature of interest and importance connected with the works is the recent experiment looking toward a supply of pure water, of which about 100,000 gallons daily are required, independently of that received from the Passaic river. In the hope of securing a flowing stream on their own premises an artesian well was started by the company in September, 1879. Veins of varying character were successively tapped down to a depth of 1,200 feet, when a stratum of quicksand greatly obstructed operations. This difficulty being overcome by piping the well, a further depth of 800 feet was bored without a drop of water. At this depth, 2,000 feet, a vein of salt water was struck. Professor Cook, the State Geologist, had watched the pro-

gress with deep interest and given valuable advice, and while in the interest of science it was desirable to keep on drilling there was no reasonable hope held out of avoiding the salt water, the saline qualities of which would prevent its use in the boilers. Therefore it was resolved to plug the bore above the quicksand and remove the piping and make the copious supply of water, which rose to a point about 30 feet below the surface, available by pumping. A second well was sunk three feet distant from the first to a depth of 600 feet (both bores being 6 inches in diameter), and the two yield a supply of about 150 gallons per minute, singularly free from solid matter and delightful to the taste. Permanent pumps were placed in position, and the works are now fully supplied from these wells. The undertaking, while not successful in accomplishing precisely the object sought, has been abundantly satisfactory in its results ; it has been clearly demonstrated that Paterson has a never-failing water supply held in store in its own foundations.

THE UNION BOLT WORKS.

This establishment, located at 118 Railroad avenue, was first started in 1867 by Peter Green and Stephen Gould for the manufacture of bolts, spikes, rivets, tubes for boilers, etc., the name in the outset being "The Central Bolt, Spike and Rivet Manufacturing Company." The object was to supply the boiler-makers with flues and the locomotive shops and the various machine works about Paterson with rivets, bolts and other small parts. A large business was done for some time, and, among others, a Boston capitalist, Daniel Harwood, became associated with the founders in the prosecution of the enterprise. But in later years the locomotive and machine shops began to make almost everything used in their operations on their own premises, and the works were not very successful. In 1871 the entire establishment was sold to Mr. Harwood, who placed Antelmo Zini, more recently engaged in the coal business, in charge, and the name was changed to the Union Bolt Works. A few years later the works were again sold, and James Johnston and Arthur B. Pearce secured a controlling interest, which status continues to the present, Mr. Johnston being President and Treasurer and Mr. Pearce Secretary. A foundry has quite recently been added, the product is more varied than in former years and the concern is again prosperous, the product including machinery of different kinds. There are from 75 to 100 hands employed, according to the pressure of orders ; the sum of \$36,000 was paid in wages during 1881.

About 1863 John Brown & Son started a boiler works on Railroad avenue and after a few years sold the business to John Latimer & Son, by whom it was continued until somewhere about 1876, when it was discontinued.

Peter Oberg, of the firm of Oberg & Demarest, grocers, has for some years been running a small forge at West Paterson, where he employs a few hands in making blooms for rolling, utilizing scrap iron for the purpose. The production from this class of material is of peculiar excellence, and is of great value for special purposes, where a superior quality of iron is required.

WIRE-WORKING

Has from an early date been a considerable industry in Paterson. Oshea Wilder established a wire factory about 1812, as before noted, and continued the business until after the termination of the late war with Great Britain. Afterward Whittemore's beautiful invention was introduced and a card factory was started that maintained a prosperous existence for more than a quarter of a century. There are several at present engaged in wire-working in Paterson, among the largest concerns being that of George Broomhead, whose father began the business as early as 1854, in the Union Mill. He manufactured wire for making hoop skirts and for other purposes. About this time Tunstell & Beggs had commenced to make machines for rolling and stretching wire and R. Thompson was engaged in the same business. Mr. Broomhead, the elder, sold out to one Chamberlain, before alluded to, and then purchased the location of the present Broomhead wire works, at the Southern terminus of West street bridge, West side, where the business has been prosecuted for the past twenty-six years and with a fair measure of success. Some years since the elder Mr. Broomhead retired, and George Broomhead, who succeeded him, is now sole proprietor. About a half-dozen hands are employed; space 75x100 feet is occupied, and the daily product averages 1,000 lbs. of steel wire per day. But the work is largely on specialties. Some twenty years ago the elder Mr. Broomhead had a large mill at Weavertown, but this proved a non-paying enterprise and it was abandoned about the close of the late war of the Rebellion.

W. A. Havens & Son began in 1870 the making of wire signs, window screens, wire fences and all manner of wire products at 132 Broadway, where the business is still continued.

FILE-MAKING

Also has for many years been among the important manufactures of Paterson.

J. S. Whitfield was engaged in file-cutting on Railroad avenue about 1862. At his death in 1869 Veit Weinmann and James Kearney purchased the business and in 1872 removed to the present location of Kearney & Foot, on Van Houten street, in the rear of the old Nightingale Mill, occupied by Joseph Nussey & Co. After about a ten years' operation the firm of Weinmann & Kearney dissolved, in 1879, when Mr. Kearney associated with himself James D. Foot, and the business has since been conducted with such ability that it has expanded to double its former proportions. About 100 hands are employed on new goods, entirely, the work being done mainly by machinery. Every new improvement is at once adopted and the very best of tools and machinery are in use by this enterprising firm. The output is constantly increasing. The facilities of the establishment are of the most ample character. The annual product will average \$100,000 in amount. The premises occupied consist of a main building, 90x30 feet; side section, 70x20 feet; hammer shop, 20x30 feet; annealing and forging shop, 20x22 feet.

In 1865 John A. Smyth began the manufacture of files in a small shop in the rear of the Franklin Mill. Soon after he was associated with another practical file-cutter named Pennington, and the firm remained Smyth & Pennington from about

1866 to 1879, making files both by hand and by machinery, using six machines. When Weinmann & Kearney dissolved, in 1879, the firm of Smyth & Pennington also dissolved, Mr. Smyth removing to Albany, N. Y., and Mr. Weinmann associating with himself a New York gentleman named F. W. Gesswein. The new firm, styled Weinmann & Gesswein, succeeded Smyth & Pennington in the occupancy of the Franklin Mill premises, where they remained a few months, when there was another dissolution, Mr. Weinmann establishing himself at 34 Madison street, where he is still manufacturing in a small way, and Mr. Gesswein continuing in the old place, where he does a considerable business and employs a number of hands in cutting, both by hand and machinery; also in recutting old files.

John A. Hyde, formerly Hyde & Walker, has been engaged in the file manufacture for several years at 29 Prospect street, near Broadway. At first but three men were employed; now ten are kept constantly at work cutting and recutting, both by hand and machinery. Two rooms, each 20x30 feet, are occupied, and the grinding is done in a room at the river, where a two horse-power engine is used. The production is from 80 to 100 dozen files daily.

Six years ago there were twenty-three establishments engaged in the iron industry, including locomotive-building, making stationary engines, steam fire-engines, cotton, silk, flax, hemp, jute, oakum and other machinery and millwright work, bridges, forgings for locomotives and steamboats, merchant and angle iron, beams, files, bolts, rivets, spikes and washers. In 1873 the Passaic Rolling Mill Company made and shipped 6,000 tons of merchant iron and beams and 720 tons of rivets within the year; the locomotive shops turned out 480 locomotives; the Paterson Iron Company made 1,600 tons of forgings; the various foundries, 9,800 tons of castings for locomotives, bridges and machinery, the bridges alone using 1,400 tons of pig and 2,500 tons of wrought iron; the file-makers' product aggregated, 28,600 dozen files, the Union Bolt Works made 850 tons of bolts, spikes, and rivets, the sewing-machine works made 6,000 machines, the spindle and flyer-makers used 14,000 pounds of steel and iron, the Steam Fire-Engine Works made ten to twelve engines; 40 general jobbing blacksmith shops employed 91 hands. Total number of hands employed in all the above, including the locomotive shops, about 5,300; total disbursement for wages, \$3,180,000; total value of production, \$9,850,000.

The statistics of the iron industry of 1881 are: Number of hands employed in all branches, exclusive of locomotive building, 2,485; including locomotive building, 5,827. Amount disbursed in wages, exclusive of the locomotive industry, \$1,491,000; including the locomotive industry, \$2,789,050. Total value of iron productions, exclusive of locomotives, \$4,950,000; including locomotives, \$9,362,500. Number of establishments in all branches of iron-working, exclusive of locomotive-building, 41; including the locomotive works, 44.

In 1876, in closing his valuable article on "The Iron Industry of Paterson," the late John Cooke remarked:

"And now, in this the third quarter of the century, we can look back to the

first, and see how the pioneers of this industry must have struggled for an existence. Without capital, experience, skilled labor or tools, they persevered, and to-day Paterson is reaping the fruits of their labor in a name and reputation for skill in the mechanical arts that is as extended as our country, and which will bring wealth and prosperity to our city. No monumental bronze or stately column has by the people been erected to perpetuate their memory, but from all over this Union, from Mexico, Central and South America, and from foreign lands, comes a voice to us in the hum of thousands of spindles, echoed by thousands of locomotives as they wind through valleys or pass over mountains, saying: 'To John Clark, father and son, and to Thomas Rogers give all honor for planting and nursing an industry which has done so much to make Paterson what it is to-day.' Following in their footsteps, let us as citizens do all we can to foster and extend it."



CHAPTER XXII.

LOCOMOTIVE-BUILDING.—THOMAS ROGERS.

THOMAS ROGERS, the founder of the locomotive-building establishment which bears his name, the productions of which vast industry have achieved a world-wide renown, was born March 16th, 1792, in the town of Groton, Connecticut. This is in New London County, and lies on the opposite side of the Thames river from the city of New London. Mr. Rogers served in the war of 1812 with much distinction. He was a lineal descendant of Thomas Rogers, one of the Pilgrim Fathers, who came over in the Mayflower. At the age of sixteen he was apprenticed to learn the trade of house carpenter, and four years later, or in the Summer of 1812, he came to Paterson, then a small village, but prosperous on account of the demand for American manufactures brought about by the war with Great Britain. Upon this, the nucleus of the future industrial centre, the sturdy New Englander was destined to leave the impress of his wonderful skill and indomitable energy. The collapse of 1815, elsewhere alluded to in this work, followed very soon, however, and Mr. Rogers did not find the opening a very brilliant one. For a time he was employed as a journeyman carpenter, during which he was noted for his constant application to his work, his good judgment and extraordinary force of character. Later he associated himself with Paul Rutan, and the two together are said to have been possessed of a capital amounting to at least \$50. They built the woodwork of the residence of the late Judge Dickerson, on Broadway, corner of Straight street; also the residence on the Northwest corner of Broadway and Paterson street, known as the "Bibby House." The former, now the property of John Gould, a son-in-law of Judge Dickerson, is among the oldest houses in Paterson.

After Mr. Rogers had been working in Paterson a few years, Captain Ward, a somewhat famous character in that day, who had been travelling in Europe, where he had witnessed the power-loom in operation, came to Paterson for the purpose of engaging in the manufacture of cotton duck. Mr. Rogers, whose natural ability and acquired skill were at once recognized by Captain Ward, was employed by him in making the patterns for his looms, and in the end, being fascinated with the idea, he purchased from Captain Ward the right of making the looms, a business which he afterward prosecuted with great success. Next we find Mr. Rogers in the machine shop of John Clark, the elder, where he applied for and was given work,

The introduction of power-looms was just then attracting much attention, and as the looms were largely built of wood the builders were, so to speak, a sort of machine-carpenters, and skill and originality were excellent qualities in a workman. Mr. Rogers was noted for making more shavings and turning off more work than any of his fellows, and, what was still more important, his inventive genius enabled him to make many valuable improvements.

After the retirement of John Clark, Sr., about 1816, John Clark, Jr., and Mr. Rogers became partners, and engaged in the manufacture of machinery, at first in a very small way, at the same location. Afterward General Abraham Godwin, Jr., his father's successor as host of the "Old Godwin House," and who was also one of the earliest storekeepers in Paterson, was admitted, and the style of the firm was Godwin, Rogers & Co. While the firm consisted of Messrs. Clark and Rogers only they continued to occupy the "Little Beaver Mill," and Mr. Rogers visited Mexico and other distant countries and received quite large orders, for that day, for looms and other machinery. After their association with Mr. Godwin the works were removed to Market, then Congress, street, the site of the present Danforth Works, occupying a building erected by Robert Collett for a cotton mill. The firm of Clark & Rogers was not very well supplied with capital, but when the third partner was taken into the concern it was financially strong.

Prior to the formation of the first partnership John Clark, Sr., was the head and front of all the machinery business in Paterson; from the partnership dates the commencement of the great Rogers enterprise, which a few years later resulted in building the first locomotive in Paterson, the inauguration of one of its grandest industries. The Collett Mill, still standing in the rear of the Danforth lot, was soon found to be too small, and the Danforth machine shop and foundry (as existing before the destructive fires of quite recent date) were built, half size. In April, 1823, the firm bought out the foundry and moulding shop, the entire plant, of William Jacobs, located on the rear of what was since known as the Van Winkle lot, Van Houten street, now included in the premises of the Phoenix Manufacturing Company. This plant was removed the following month to the foundry of the firm in Market street, and thus nearly a quarter of a century from the humble beginning of the elder Clark all branches of the iron industry connected with the building of machinery were united under one management.

Subsequent to the establishment of the company with all their works complete Godwin, Rogers & Co. experienced about eight years of successful operation, when, in 1831, the firm dissolved, Mr. Rogers retiring. According to the record found on the old books of the company, the date was June 27, 1831, the entire stock at that time being valued at \$150,382.86. Mr. Rogers judging, and with reason, that the property of the firm was overvalued, sold his interest for \$36,266.05 in hand. This was a sad blow to the remaining partners, and Mr. Rogers was wont to remark of the transaction: "They gave me about \$40,000 to go out, and they haven't much left." The fact was he was the backbone of the establishment, so far as active operations were concerned. All the partners, together with the other leading men of Paterson in that day, were in the habit of spending their evenings at the great rendezvous of the time, the "Godwin House," afterward the Passaic Hotel, and



Thomas Rogers

most of them frequently prolonged their sittings to a late hour. Mr. Rogers, on the contrary, rarely overstayed ten o'clock; when that hour struck he would arise and, making some remark implying that he had work on the morrow, betake himself to his home. Next morning, when the others were feeling dull and indisposed to business, he would be abroad with the earliest of the men, alert, tireless and full of resources.

Upon the withdrawal of Mr. Rogers from Godwin, Rogers & Co. he proceeded to erect the Jefferson Works, or Mill, having purchased a site on the back raceway, the location being next adjoining the present Ivanhoe Mill. The building was erected for the manufacture of cotton, wool and flax machinery and the spinning of cotton yarn; the latter idea, however, was never carried out, at least not to any great extent, in consequence of the increasing demand for machinery. The original design was to occupy only the lower stories in the making of machinery, devoting the upper to the cotton manufacture. On the upper raceway there were at this time no factories except two little cotton mills and a small machine shop, the latter owned by Paul & Beggs.

The Jefferson Works were literally an encroachment on the forest between Mill and Spruce streets. All was swamp, covered with pines and, so says the tradition, as populous with snakes as it has since become with human beings. The new building being completed, Mr. Rogers, in the early part of 1832, associated with himself Messrs. Morris Ketchum and Jasper Grosvenor, both of New York, and both men of capital, but totally ignorant of manufacturing operations, and the business was thenceforth carried on under the firm name of Rogers, Ketchum & Grosvenor. This title remained unchanged until Mr. Rogers' death, which occurred in New York city, April 19th, 1856.



CHAPTER XXIII.

LOCOMOTIVE-BUILDING.—ROGERS LOCOMOTIVE & MACHINE WORKS.

THE earlier history of this establishment has been given in the preceding sketch of its founder, Thomas Rogers, and the thread may now be taken up at the point at which the Jefferson Works, on the back race-way, were completed, in the latter part of 1832, about which time Morris Ketchum and Jasper Grosvenor, New York capitalists, were admitted to partnerships.

About this time public attention began to be directed to the construction of railroads and railroad machinery. The railroad from Jersey City to Paterson was approaching completion, the iron work for the Passaic and Hackensack bridges having been made by Mr. Rogers. About the same date an order was executed, also, for one hundred sets of wheels and axles for a South Carolina railroad. Next came the making of wrought iron tires for car wheels, which, after encountering many difficulties, was made a success at these works.

Attempts at locomotive building had already been made by Messrs. Paul & Beggs, who had quite an extensive machine shop, for those days, a short distance from the Jefferson Works, and this enterprising firm had a small engine nearly completed when, on the 18th of May, 1835, their buildings took fire and were consumed, and with them was destroyed this unfinished locomotive engine. It was being built by William Beggs, a brother of the junior partner, who but for this fire would, in all probability, have had the honor of building the first locomotive in Paterson, for the statement is that it promised to be a success.

In 1835 some additional buildings were begun by Rogers, Ketchum & Grosvenor with a view to the manufacture of locomotives; it was not, however, until eighteen months afterward that the first locomotive, the "Sandusky" was turned out, after many difficulties had been surmounted. On the 6th of October, 1837, the Sandusky was finally completed and a trial trip made from Paterson to Jersey City and New Brunswick and back, Timothy Smith acting as engineer. The time actually required for the construction of the Sandusky was sixteen months, during which tools had to be made, numberless experiments tried and the men instructed in the work. The performance of this first engine was perfectly satisfactory. The gauge of



the road was 4 feet 10 inches, the same as that of the New Jersey Railroad and Transportation Co., for which road the engine was intended. It was, however, never placed on that road, being bought by President James, of the Mad River & Lake Erie Railroad, for use on that line, and shipped October 14th, via canal and lake, in charge of Thomas Hogg, on the schooner Sandusky for its destination. Mr. Hogg had worked on the engine from its commencement. It arrived at Sandusky November 17th, at which time not a foot of track had been laid for it to run on. The road was then built to suit the gauge of the engine, and the Legislature of Ohio soon after passed an act prescribing that all roads built in the State should be constructed of the same gauge as the Sandusky. Mr. Hogg continued to run the engine about three years, keeping it in repair. Subsequently he became Master Mechanic of the road, continuing to hold this position, on the Mad River and other roads, for about thirty years thereafter. The Sandusky was used about a year in the construction of the road; afterward it was set to pulling trains for the conveyance of passengers between Sandusky and Belleview, a distance of sixteen miles. It was continued in service many years, until the traffic of the road required a larger class of engines to do the work. It was an unqualified success, and at a recent date was still reported as being in a serviceable condition.

It may not be amiss to give in passing a brief description of this first Paterson locomotive. The Sandusky's cylinders were 11 inches in diameter, with 16 inches stroke; she had one pair of driving wheels, 4 feet 6 inches in diameter, situated forward of the furnaces; the truck had four thirty-inch wheels; the eccentrics were outside the frame, the eccentric rods extending back to the rock shafts, which were situated under the foot-board; the smokepipe was of the "bonnet" kind, having a deflecting cone curled over at the edge in its centre, so as to deflect the sparks downward and thus prevent their passing through the wire "bonnet," as well as preventing the "bonnets" wearing out too fast.

Among the improvements introduced in this first engine perhaps the most important was "counterbalancing," for which Mr. Rogers filed a specification in the Patent Office in 1837. The following is the description in the specification:

"The nature of my improvement consists in providing the section of the wheel opposite to the crank with sufficient weight to counterbalance the weight of the crank and connecting rods, making the resistance of the engine less in starting and in running, also preventing that irregularity of motion caused by that side of the wheels when the cranks are placed in other modes of fitting them up. The irregular motion which arises from not having the cranks and connecting rods balanced is attended with much injury to the engine, and to the road, and with much loss of power."

The importance of counterbalancing was not generally recognized as being necessary until several years after it had been introduced by Mr. Rogers, and when attention was finally attracted to its importance many yet doubted the necessity of balancing anything more than the cranks. Another novelty consisted in making the driving wheels with hollow spokes and hollow rim; the rim on the opposite side of the crank being cast solid. The spokes were oval and the rim very much the same in shape as seen at the present time. In fact the driving wheel invented by Mr. Rog-

ers about forty years ago has scarcely been improved upon in any essential particular since. Of this first locomotive John Cooke says: "With its round top-boiler, two drivers and wooden frame, it was quite a different affair from the locomotive of the present day." The *Northern Monthly*, date of December, 1867, in treating of "Paterson—its Works and Ways," a very valuable article, speaking of the Sandusky said "This engine would be a striking contrast could it be placed alongside of one of the magnificent machines now turned out of the Paterson shops (there have been many finer and better ones turned out since 1867) and which seem to have reached the perfection of mechanism, although, doubtless, the locomotive of the future will be as far beyond that of the present day as the 'America' is above the 'Sandusky.' This was prophetic.

It may be interesting to know in this connection somewhat as to the order, relative to time, in which the first Paterson locomotive was built. The Sandusky, though not the first, was among the first engines built in this country, and was probably a signal improvement on all others running on American roads. According to Bishop's History of American Manufactures, published in 1866, the first locomotive that appeared in this country was brought by Horatio Allen from England in the Fall of 1829, and was set up at West Point and placed on the Delaware and Hudson River Railroad either at Honesdale or at Carbondale, Penn., the next Spring. This engine proved too heavy for the track, a crude and imperfect one, and was soon abandoned. The same authority states that the first engine built in this country was turned out at the West Point shops in 1830, for a South Carolina railroad. This engine, named the "Phoenix," was a partial success. A writer in *Science*, however, gives the credit of building the first American locomotive to Peter Cooper. It is described as weighing less than a ton, with a three-and-a-half inch cylinder, and a boiler about "as large as an ordinary kitchen boiler," with gun barrels for flues. It was named the "Tom Thumb." The same authority says that the first American locomotive built for actual service was "The Best Friend," built at West Point for the Charleston & Augusta Railway and placed thereon October 20th, 1830. The writer adds: "The name of the first American locomotive seems to have been inspired, for it has in the largest sense proved our 'Best Friend.'" The first locomotive for a Northern road was built under the auspices of Governor De Witt Clinton, of New York, for the Mohawk & Hudson Railway, from Albany to Schenectady. This was the first locomotive in the State of New York; it was named the "De Witt Clinton." It was not a success. The next in order was commenced in 1832 at the now famous Baldwin Works, Philadelphia, for the Philadelphia & Germantown road, and was placed on the road in January, 1833. This was a signal success; Bishop says it made a mile in less than a minute, up and down grade, and this performance was not excelled for many years thereafter. The same authority says of the first locomotives turned out at the Rogers Works, one or more, for the New Jersey Railroad, that one of them drew a train of 120 to 130 tons up a grade of 26 feet to the mile at an average rate of speed of 24 miles an hour, which feat had not been equalled by any of the engines that had been brought from England at that time.

Having given a description of the first Paterson locomotive and its perform-



William Lounsbury

ance, it may be well at this point to devote some space to a brief sketch of the builder. Although forty-four years have elapsed since the Sandusky was built—nearly half a century—and the man to whose natural genius, acquired skill and indomitable perseverance its successful completion was mainly due was at the time in the vigor of his manhood, he is still not only living, but is comparatively hale and strong. He is found performing daily the responsible duties devolving upon him as Comptroller of the city of Paterson, to which office he is elected from year to year without even the shadow of opposition, his eminent ability and fitness being acknowledged by all, regardless of political preference or private ambitions.

William Swinburne was born in Brooklyn in 1805, and is, with perhaps one or two exceptions, the only one living who had anything to do with building the Sandusky. While working at his trade as a carpenter, at the age of eighteen, Mr. Swinburne assisted in building the old St. Ann's P. E. Church, opposite the Sands Street M. E. Church, Brooklyn. In St. Ann's Church were 1,500 small window lights in Gothic sashes with circular-headed frames, and these sashes were the work of Mr. Swinburne. This church, after standing about fifty-seven years, was razed about two years since to make way for the march of improvement in the shape of the great Brooklyn bridge. Mr. Swinburne's memory, which is excellent, reaches back to the time when there was no way of crossing between Brooklyn and New York except by row-boat. The first step toward improved facilities was the horse-boat; next came the first steam ferry-boat, the "Nassau," about 1814. This was shortly after Fulton had made his experiments on the North River. In 1827, when Mr. Swinburne was about twenty-two years of age, two notable events occurred; one was his removal to Matteawan; the other was his marriage to Melissa Doughty, of that place. At Matteawan he was engaged until 1833 in making patterns for machinery, etc. In that year he came to Paterson and went to work for Rogers, Ketchum & Grosvenor in the Jefferson Works, then just completed. The product was cotton machinery almost exclusively. Mr. Swinburne made the patterns and soon attracted attention by his skill and industry. At this time Paul & Beggs were running their works, nearly as extensive as those of Rogers, Ketchum & Grosvenor, and turning out mill-gearing, they being the only millwrights to be found within all the section of country about Paterson, and sending out men to a great distance to put up their work and equip new mills. When the fire occurred which consumed the establishment of Paul & Beggs, about 1835, together with all their patterns for mill-gearing—invaluable in those days—and a locomotive nearly completed, as before described, mill-owners were driven to Rogers, Ketchum & Grosvenor to induce the firm to go into the production of mill-gearing. What was left of the plant of Paul & Beggs was taken by Rogers, Ketchum & Grosvenor, and a millwright shop was built, one story of stone, on the Southeast corner of Spruce and Market streets. Here the new line of work was undertaken, Mr. Swinburne making all the patterns being, in fact, about the only one capable of doing it at the time.

When the Hudson River Railroad from Jersey City to Paterson was completed Mr. Swinburne went to see its operation, when only a trial trip had been made over the road. The Paterson depot was where St. John's Catholic Church now stands. He was very greatly impressed with the wonders of the iron horse on the iron track

—quite overcome, in fact—and, as he says, would have deemed any one mad who told him that he would one day build a better locomotive than the English-built “McNiel.” So he kept on making patterns at the millwright shop until, in 1835, the building of the Sandusky was begun and his services were required in a new direction. Great expectations were entertained by the firm as to the result of the skill of Mr. Hodge, an English mechanical draughtsman, upon whom every dependence was placed in connection with the production of the first locomotive. It is said that he was a very accomplished man, but he was not a genius, and it was soon clear that he had undertaken a task he was utterly unfitted for. In the beginning Mr. Swinburne was employed in making patterns after his drawings, but soon the natural talent of the former enabled him to see that no good could result from Mr. Hodge’s plans. He convicted him, in argument, of being from 25 to 30 per cent. out of the way in his calculations as to the passages from the boiler to the steam chest, and demonstrated so clearly that he, Mr. Swinburne, was right that the other, whose pride was terribly wounded, was compelled to acknowledge his error. But he fell into others. He had the boiler made first, and so far astray were his calculations that when it was completed there was found to be not space enough to put the furnace in the shell. There were other difficulties also, and at last Mr. Rogers discharged him. He assented, was paid, and left the works in high dudgeon. Then Mr. Rogers, discouraged and hopeless, said, “Lay the whole business up; put it away.” Mr. Swinburne answered, counselling another effort; reminding his employer that much of the work was done, and assuring him there would be no difficulty in getting it out. Said Mr. Rogers: “Who’ll do it?” “I will,” was the answer. “You!” “Yes; I.” “And *can* you?” “I am sure of it.” “Then go ahead. Go look at the engine at the depot, and see if you can understand it.” Mr. Rogers referred to the “McNiel.” Mr. Swinburne went to the depot and, examined the different parts with the practised eye of a skilled mechanic and a natural genius combined. Six months later the Sandusky was completed and, as already shown, was a perfect success. Mr. Swinburne did or directed everything toward the work, making the drawings and the patterns and showing the workmen how to produce the requisite parts. Mr. Rogers left all with him. Mr. Hodge, after his failure at the Rogers Works, was sent out to Russia as an engineer by Ross Winans, of Baltimore, and he died there a few years later.

After the success of the Sandusky was assured the firm of Rogers, Ketchum & Grosvenor continued to build locomotives. The next one was built for the N. J. Railroad and Transportation Company, and was named the Arreseoh No. 2. This was larger than the Sandusky and was equally a success. For this, also, Mr. Swinburne made the plans and was general factotum, serving as draughtsman, pattern-maker, superintendent of construction and foreman of foundry, blacksmith and machine shops. There was not another foreman beside in any department. The shop where the first locomotives were built was 40x100 feet, two stories in height. From 30 to 40 men were employed. After five or six engines had been built the works were greatly extended, until they were 40x200 feet, three stories, of brick. Later, still further additions were made, and the demand for engines came in from every direction; from the East, West, North and South.





About 1840 Watts Cooke, the father of John, Watts and the other brothers Cooke, came from Matteawan (it is wonderful how many of those great pioneer mechanics and successful manufacturers came to Paterson by the way of Matteawan) where he was engaged in pattern-making. When Mr. Swinburne was drawn from the business of making patterns for mill-gearing to locomotive work Mr. Cooke succeeded him and was the only one engaged in that department until, on one occasion, all being very busy, it was proposed to bring John Cooke, his son, in to assist. The young man was then about seventeen years of age. Mr. Swinburne wished to set him at work to make a cylinder pattern. Watts Cooke, his father, demurred, but Mr. Swinburne insisted that the young man would succeed, and persevered, instructing him until John turned out a very good pattern. He continued to improve, making rapid progress, and soon was set to finish full-size drawings. When Mr. Swinburne left the works of Rogers, Ketchum & Grosvenor, about 1845, he recommended a Mr. Thurston as his successor, but that gentleman proving incapable, John Cooke soon succeeded him and became Superintendent of the entire locomotive business of the concern, showing remarkable ability, though he was still very young—not more than twenty years of age.

The third engine built at the Rogers Works differed from the two first; its cylinders being 10x18 inch stroke and the gauge 4 feet, 8½ inches. Both the driving and truck wheels of this engine had hollow, oval spokes and hollow rims with wrought iron tires. It was named the "Clinton" and was built for the Lockport & Niagara Falls road; it was delivered in April, 1838. It was sold in 1843 to the Toledo and Adrian Railway Co. for \$6,500—first cost. William E. Cooper, the engineer who ran it, says that when sold the Clinton was regarded as the very best working engine in existence.

The fourth engine built at the works was the "Experiment," made for the South Carolina Railroad, and delivered in June, 1838. This differed from any of the others in having a smaller cylinder and a longer stroke. The fifth was named the "Batavia," and was completed in October, 1838, for the Tonawanda road. This differed from any other foregoing in having the driving wheels back of the furnace, which was semi-circular at the rear part, and had a hemispherical top surmounted by a dome. The Batavia was so constructed that a part of the weight of the tender could be transferred to it to increase the adhesion, should it be found necessary.

An extraordinary feat of an early Rogers locomotive is related in the *American Railroad Journal and Mechanics' Magazine*, published in 1839, in an article on American locomotives, as follows:

"Owing to some circumstances of which I am not informed, it became necessary for a locomotive on the way from Jersey City to New Brunswick, to take, in addition to its own load, the cars attached to another engine, which made the number equal to 24 loaded four-wheel cars, and this it did with as much apparent ease as could be desired, notwithstanding the grade for four miles is equal to 26 feet per mile, stopping on the grade to take in passengers, and starting again with the greatest ease. The average speed on the grade was 24½ miles an hour. This may not be in your estimation anything extraordinary, yet I consider it a performance worth recording, by way of contrast with the greatest and most remarkable performance of a locomotive ever heard of in those days, which occurred on the Liverpool and Manchester Railroad in 1829, only ten years ago. Twenty tons on a level road at the rate of ten miles per hour, was then considered wonderful! astonishing! even in a country famed for its extraordinary discoveries; yet here, only ten years after, we see an engine, built in this country too, taking a load probably equal, cars and tender included, to 120 or 130 tons at the rate of 24½ miles per hour up a grade of 26 feet per mile. This engine was built, I understand, at Paterson, New Jersey, by Messrs. Rogers, Ketchum and Grosvenor, a concern not

yet so well known to this railroad community as manufacturers of locomotives as they ought to be, or as they soon will be if they continue to turn out such machines as the one above alluded to. If such have been the improvements in the past, what may they not be, permit me to ask, in the next ten years? Pardon me for thus troubling you, but my aim is rather to call attention to the rapid march of improvement in this mode of communication, than to direct attention to any individual or company, although those gentlemen, in my opinion, deserve as manufacturers much more than I have said of them.

Yours respectfully,

JERSEY BLUE.

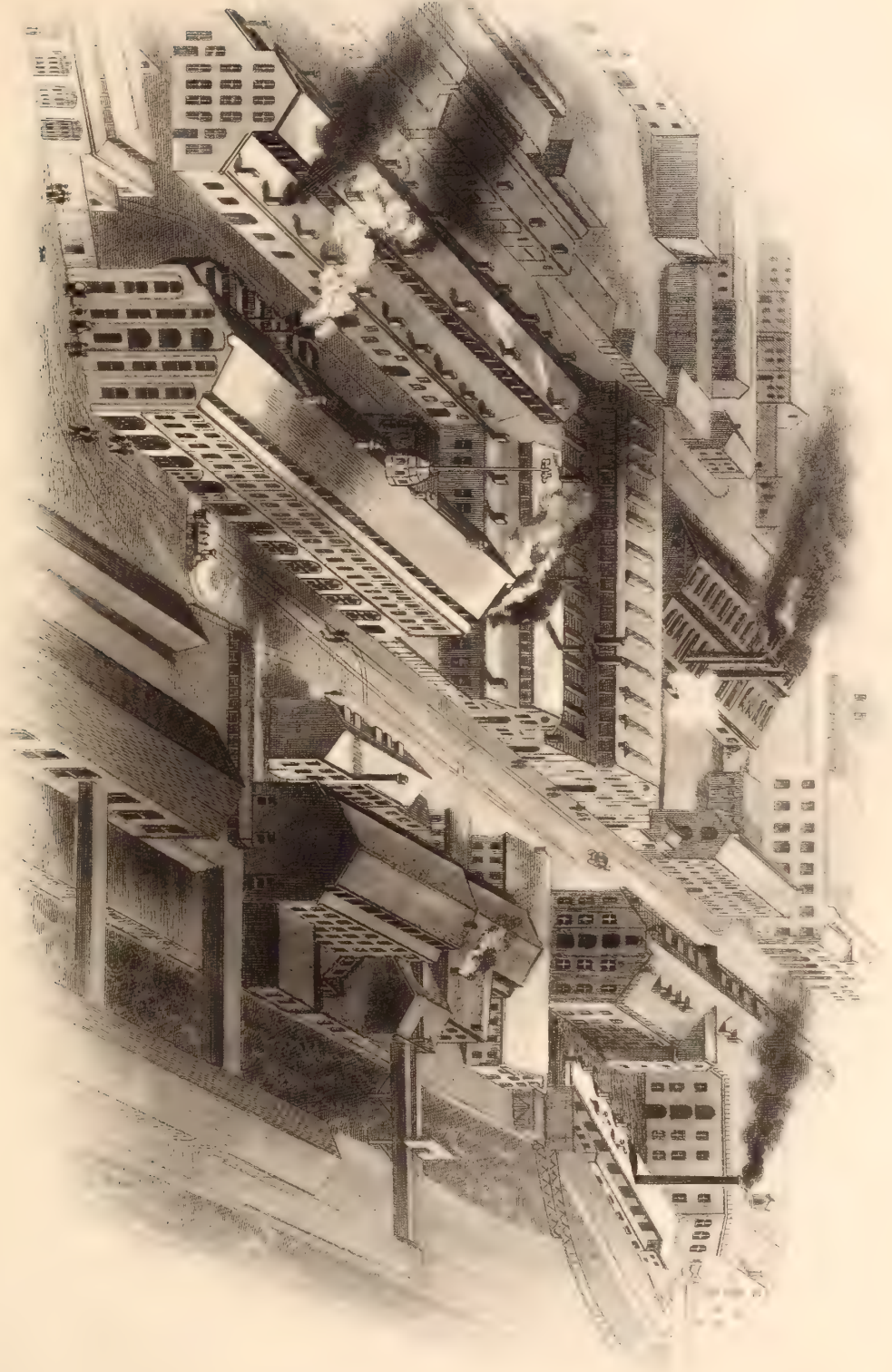
NEWARK, N. J., December 14th, 1839.

In spite of financial revulsions, the establishment of Rogers, Ketchum & Grosvenor continued to go on and prosper, increasing its facilities with the growth of business. When it is considered that the pioneers of industrial enterprises have generally gone to the wall, the successful career of this firm is the more to be wondered at; but the New York partners were men of abundant means and decided financial ability, while Mr. Rogers joined to great penetration, irresistible energy and a powerful will sufficient cautiousness to make his judgment almost infallible.

In the year 1838 seven engines in all were completed, after which the production gradually increased until in the year 1854 one hundred and three engines were built. The works were enlarged and improved from time to time until the many vast and substantial structures occupied for locomotive-building and its dependencies presented the appearance of a considerable village, extending on both sides of Spruce street far Southward from Market; also across to Pine street to the Eastward and back to "the Cedars" West of Spruce. The equipment of the works up to the time of the disastrous fire in the Winter of 1879 was not excelled in this or any country, comprising all the tools and facilities for turning out perfectly accurate work; many of them being of new and improved design, manufactured expressly to the order of the Company. These have been replaced, since the fire, at a tremendous outlay of money. During the war the Rogers Works turned out from ten to twelve engines each month, and the three locomotive works then in operation an average of at least one per day. In 1873 the capacity of the Rogers establishment was rated at one completed locomotive for every second working day in the year.

The firm of Rogers, Ketchum & Grosvenor maintained a prosperous existence until the death of Thomas Rogers, the great projector of the industry, in 1856, when the surviving partners reorganized under a charter and the name was changed to the Rogers Locomotive and Machine Works, which is still retained. Since 1869 the company have discontinued the building of machinery and have devoted the entire capacity of the works to the production of locomotives.

This vast establishment has shown that mature years do not necessarily result in the sere and yellow leaf of inertia or decadence. Evidence of this is found in the *style* that marks their engines, a point less thought of usually where ripe self-sufficiency prevails. Wherever one travels and meets one of the splendid engines from Rogers' he may know at a glance its builders. It is certain that the average judgment of travelers awards this verdict and the leading railroad officers agree. Perhaps no concern in this country has done so much to popularize the locomotive and to make it the easily-managed and powerful motor it is to-day—the veritable "iron horse;" a servant that yields as ready obedience to its driver as its fleshly namesake. The statement is made, and on good authority, that no first-



class engine is made in this country which does not use, either in boiler, or wheels, or smoke stack, or lever, one or more principles first introduced by the skilled artisans above alluded to. Among the many valuable improvements brought out at this establishment for the first time in this country, or indeed anywhere, may be mentioned expansion plates and braces, outside connections, vertical flues in boilers, V hooks and wide pendent cut-off valves, shifting-link motion, counter-balancing, hollow spoke cast-iron wheels, the horizontal cylinder and spread truck, etc. Since 1849 more particularly have these engines taken the highest position, so that Paterson locomotives are now admitted to present the most perfect type of any built.

The *Railway Times* in an issue of recent date publishes a report made by the Buffalo and State Line R. R. in regard to one of the Rogers ordinary six-wheel driver freight engines, which was put on the road December 15th, 1856, and had run two years and eighteen days when the report was made, showing the following record: trips, 617; miles, 55,530; cars hauled, 18,295; average train, 30 cars. The aggregate cost of repairs was \$1,140, or $2\frac{1}{2}$ cents per mile run. If the number of cars is multiplied by 88 miles, the length of the road, the result is equivalent to one car hauled 1,609,906 miles, and if, as stated, $12\frac{1}{2}$ cents be the average earnings of a car per mile, this would make a total of \$201,245 as the actual earnings of this freight engine in a few days over two years.

In 1860, when the works were turning out locomotives at the rate of upward of eighty per annum, there were 550 men employed on engines and on cotton machinery. It would be impossible, within moderate limits, to attempt to name even the principal roads on which Rogers locomotives are running; it would be less difficult to name those where they are not. They have gone to every country in the civilized world. For one road alone, the Illinois Central, over one hundred have been built. Two Rogers engines competed with English engines on the Southern Railroad of Chili about twenty years ago and won a signal victory, and since that date many engines have been sent to that and other South American countries. This test of American *vs.* English engines is thus described by Bishop:

“In 1859 the Southern Railroad of Chili ordered from the Rogers Works a freight and a passenger engine; at the same time they sent an order to England for similar engines, with a view of testing the comparative merits of American and English locomotives. The English builders, anxious to secure the South American market for their engines, made the cylinders of both their engines considerably larger than ordered, with a view of obtaining more power. The trial lasted through four days—one day for each locomotive—and resulted in demonstrating the very great superiority of the American locomotives, as the American freight engine “San Bernardo” performed in forty-one minutes what the English engine could only do in eighty-eight minutes; and the American passenger locomotive hauled a loaded train up a steep grade seventeen miles in thirty-four and a half minutes, which the English engine could not do in less than forty-nine minutes.”

The *American Railroad Journal*, date of September 24th, 1859, says of this locomotive tournament:

“A summary of the dimensions and comparative calculated powers of the respective locomotive-engines on the Southern Railway of Chili, showed that the

English engines should have exerted an effect more than 11 per cent. greater than the American. Now for the result as indicated by notes taken at the trial :

" The 1st day.—The San Bernardo, American goods engine, by the Rogers Locomotive and Machine Works of Paterson, New Jersey, took her train of 35 eight-wheeled cars, gross tonnage 587, from Santiago to the summit, $11\frac{3}{4}$ miles, in 41 minutes, making one experimental stop of $1\frac{1}{2}$ minutes on the way, to see if she had adhesion sufficient to start her train on a gradient of 13 feet per mile, which she did without slipping, one brake being on by carelessness. At $13\frac{3}{4}$ miles stopped and switched off 10 cars, took water, and carried 25 cars to the Maipu river. Returning, carried back to Santiago 20 loaded cars, total 369 gross tons—run to the summit from the bridge, 6 miles, in $20\frac{1}{2}$ minutes—made steam very free—had to keep the fire-door open most of the time to keep the steam down to the limit, 115 pounds.

" The 2d day.—The Varas, English goods engine, by R. & W. Hawthorne, of Newcastle, started the same train of 35 cars, load 587 tons, of the day before on a descending gradient of 20 feet per mile for one mile ; thence one mile nearly level, thence one mile ascending a gradient of $31\frac{1}{2}$ feet per mile ; she ran this distance of three miles in 10 minutes, then stopped for want of steam. The train was then backed to the $1\frac{1}{2}$ mile post, and again started with 130 pounds of steam ; this time she reached the $2\frac{1}{2}$ mile point, and again stopped, not being able to supply herself with steam. The train was then backed to the station, when a third trial was made, with 20 loaded cars ; gross tonnage, including engine and tender, 370 ; she ran to the $4\frac{1}{2}$ mile point in $14\frac{1}{2}$ minutes, and stopped for want of steam ; stopped 20 minutes, then started with 115 pounds of steam, and run to $9\frac{1}{2}$ mile point in 30 minutes, and again stopped for want of steam ; remained there 16 minutes, and again started with 95 pounds of steam, and run to the 11th mile in 7 minutes, making the 11 miles in 88 minutes. She then stopped and returned with the train to Santiago.

" The 3d day.—The English passenger engine Montt, by R. & W. Hawthorne, of Newcastle, started from the Santiago station, taking a train of 15 loaded eight-wheeled cars—gross tonnage of train, 288—running to the summit, $11\frac{3}{4}$ miles, in 37 minutes 50 seconds, including one stop of 3 minutes 15 seconds, to experiment on starting, which she did without difficulty. Total time to the 17th mile, the end of the route, 49 minutes ; returning, she carried back the same train to the summit, 6 miles from the Maipu River, in 25 minutes 4 seconds, and returned with her train down grade to Santiago.

" The 4th day.—The American passenger engine Santiago, by the Rogers Locomotive and Machine Works, of Paterson, started from the Santiago station, taking a train of fifteen loaded eight-wheeled cars, gross tonnage of train, 290—running to the summit, $11\frac{3}{4}$ miles, in 26 minutes 6 seconds, including one stop of one minute to experiment on starting, which she did without difficulty. Total time to the 17th mile, the end of the route, 34 minutes 30 seconds. Returning, she carried back the same train to the summit, 6 miles from the Maipu bridge, in 22 minutes 31 seconds, and returned with her train down grade to Santiago. This closed the trial, which resulted in the superiority of the Rogers locomotives, of both classes, going and coming, although the calculated power of the Hawthorne engines was, in each class, 12 per cent. the greatest as to tractive power, and more as to fire surface and adhesion.

" The result of the trial created the liveliest satisfaction on the part of the American engineers and residents in Chili, as it completely vindicated their national reputation in the matter of mechanical skill, upon which physical superiority, at least, depends ; and at once placed them in favor with a people with whom the locomotive engine is too new a wonder not to have its performances viewed with admiration, and who accept superior merit in such an affair as a test of national superiority. The manufacturers, though some 10,000 miles away, whose skill supplied the means for the triumph, came in for a large share of the gratification felt and expressed.

" From the data given, we are unable to point out the precise cause of the superiority of the American engine. Whatever it may have been, it must be referred to superior mechanical skill, either in the better adjustment of the parts, in their more perfect finish, or in the use of those contrivances which utilize the power generated in the highest degree. For the English engineer to point out the cause of the unsatisfactory results attending his engines at the trial would be simply a confession of mechanical inferiority.

" A triumph like the one recorded is of national value. The reputation of the Rogers Works at home has been firmly established by the uniform excellence of the engines constructed by it, from the first one turned out to the present time. To create a reputation for its engines in other countries is to elevate in the eyes of the world our mechanical skill as a people, and to open outlets for the products of our industry, in which others can share as well as those who, by the excellence of their work, first opened the markets to us."



Rev. J. Hughes

In 1864 the Rogers Company received an order from the United States Government for nineteen locomotives, of the value of \$20,000 each, which they completed and delivered in three months, a feat of rapid workmanship not paralleled, it is held, as ordinarily four or five months are required for the execution of an order for half the number.

In 1868-9 the works of this company included two blacksmith shops, one two hundred feet long by thirty-one feet wide, the other one hundred and two by forty feet; a boiler shop, thirty-three by two hundred feet; an erecting shop of the same size, and numerous auxiliary buildings, with the requisite tools and accommodation for a thousand workmen. They were employing over eight hundred and fifty hands and turned out an average of ten locomotives per month, besides a variety of machinery for cotton and woolen manufacture.

The only great fire which has occurred at the Rogers Works was that of February 13th, 1879, at which time the immense millwright shop, with its almost invaluable contents, patterns, tools, machinery, etc., were destroyed, entailing a loss above the comparatively slight insurance of fully \$100,000. The burned portion of the works has since been entirely rebuilt and large additions made thereto. Several years prior to the date of this great fire there was a considerable fire in the foundry belonging to the works, but with these exceptions this establishment has enjoyed a remarkable immunity from disaster of this nature.

During 1881 there was completed a fine new fireproof building, of pressed brick, three stories in height, for offices, draughting rooms and the storage of valuable documents and drawings. This was built on the site of the old one-story office and the polishing shop, on Spruce street next adjoining the Ivanhoe Paper Mill. Other important additions and improvements were made during the year 1881. The old storehouse at the corner of Stony Road and Spruce street, also other buildings adjoining, have been torn down and remodelled into one extensive building, affording double the capacity of those removed. This is occupied for frame-fitting and light machine work. Adjoining, at the rear, over the race, a new brick storehouse has been built. Other important changes have been made, and new boilers have been put in at the millwright, erection and tank shops. Following is a comparative exhibit of the operations of this establishment, stretching over a space of nearly half a century:

Status at the date of fullest operation, in 1873, just before the panic:—Number of hands employed, 1,648; amount disbursed in wages, \$993,500 for the year; value of product, \$3,300,000; number of locomotives turned out, 190.

Status at lowest point of depression, in 1877:—Number of hands employed, 50; disbursed in wages, \$77,896 for the year; value of product, \$200,000; number of locomotives turned out, 14.

Status at the close of 1880:—Number of hands, 1,200; amount total of wages paid, \$500,000 for the year; total product, \$962,000; number of locomotives built, 125.

Status at the close of 1881:—Number of hands employed, 1,800; amount disbursed in wages, \$675,000 for the year; total product, 240 locomotives—fifty more than were built at the works in the palmiest days of the locomotive industry, in

1873, and nearly double the product of 1880; total value of product for 1881, \$2,400,000. The total area of flooring space occupied is about 300,000 square feet; number of buildings composing the works, 25.

The following will show the number of engines turned out each year since the commencement of the locomotive industry by Rogers, Ketchum & Grosvenor in 1836, and by this it will be seen that to the close of 1881, a grand total of 2,926 locomotives have been built at these works—a wonderful exhibit. This number, if the average cost be estimated at \$15,000 each,* would represent a total value amounting to the enormous sum of \$43,890,000:

1837	-	-	1	1848	-	-	39	1859	-	-	53	1870	-	-	145
1838	-	-	7	1849	-	-	45	1860	-	-	80	1871	-	-	164
1839	-	-	11	1850	-	-	43	1861	-	-	28	1872	-	-	174
1840	-	-	7	1851	-	-	53	1862	-	-	42	1873	-	-	190
1841	-	-	9	1852	-	-	68	1863	-	-	74	1874	-	-	20
1842	-	-	6	1853	-	-	89	1864	-	-	104	1875	-	-	42
1843	-	-	9	1854	-	-	103	1865	-	-	96	1876	-	-	16
1844	-	-	12	1855	-	-	82	1866	-	-	103	1877	-	-	14
1845	-	-	14	1856	-	-	94	1867	-	-	71	1878	-	-	47
1846	-	-	17	1857	-	-	84	1868	-	-	67	1879	-	-	64
1847	-	-	22	1858	-	-	24	1869	-	-	123	1880	-	-	125
				1881				240							

It will be marked by noting these figures how very gradually the industry grew, and also how steadily, until 1857, when the general stagnation of business throughout the country set it back just about ten years, there being but two more engines built in 1858 than in 1847. It will also be noted that the last great panic set it back more than thirty years, for there were precisely the same number of engines turned out in 1877 as in 1845.

The present officers of the company are: President, Jacob S. Rogers; Secretary and Treasurer, Robert S. Hughes. Mr. Rogers, who succeeded to the Presidency in 1856, is a son of the late Thomas Rogers, and his management of the vast interests of the company is characterized by prudence, energy and skill. He is very rarely in Paterson, at the works, but is found daily at the New York city office of the company.

* At an early period, when by far the greater number were built, the price was at times \$20,000 and even \$30,000 each, while it is only within a comparatively few years that they have been built for \$10,000 and less.





CHAPTER XXIV.

LOCOMOTIVE-BUILDING.—WILLIAM S. HUDSON.

WILLIAM S. HUDSON, who died July 20th, 1881, aged seventy-two years, was from about 1852 to 1856 the efficient and valued assistant of the late Thomas Rogers in the important enterprises undertaken during that period, and from the last-named date to the time of his death his career of usefulness was continued under the presidency of the present head of the establishment, Jacob S. Rogers, by whom, as by the elder Mr. Rogers, Mr. Hudson's services were regarded as invaluable. For a space of nearly thirty years Mr. Hudson's was a familiar figure about the works, and his ripe experience and thorough knowledge of machinery contributed to an almost incalculable degree to the excellent character of the locomotive product of the establishment during all these years. Since the death of Thomas Rogers, in 1856, Mr. Hudson had held the position of Master Mechanic and Superintendent; virtually, he had been in charge of the details of manufacture since the date of his connection with the works, in 1852, when he succeeded the late John Cooke, who retired to enter the firm of Danforth, Cooke & Co. Mr. Hudson was regarded by the pioneer locomotive builder as "his right hand man," and he possessed the confidence of his employer in the highest degree, his large experience, great natural talent, acquired skill and inventive powers being fully appreciated. So greatly was he esteemed that in the closing years of his connection with the works the company refused to fill his place, other than temporarily, so long as there was any hope of his recovery to health, although he was unable to perform any service for a space of nearly two years before his death. A brief sketch of the earlier career of this eminent Anglo-American mechanic may not be uninteresting in this connection:

William S. Hudson was born in Derbyshire, near the town of Derby, England, and came to this country with his wife when still in his early manhood. He had been an apprentice of the great Robert Stephenson, of R. Stephenson & Co., who built the "Rocket," the first successful locomotive engine in England, which was put on the Liverpool and Manchester Railway in 1829. After having served his apprenticeship Mr. Hudson continued still at the Stephenson Works until he came to America. Upon his arrival his great talent was soon recognized, and he was given the position of Master Mechanic on the Attica & Buffalo Railway, and in

pursuance of his duties connected therewith he was frequently at the Rogers Works supervising the building of locomotives for his company. Messrs. Rogers and Hudson used to have long talks on these occasions, both being enthusiasts on locomotive-building, and when the late John Cooke resigned the Superintendency of the Rogers Works Mr. Hudson was, most naturally, invited to succeed him.

During the long period in which Mr. Hudson was identified with the establishment he produced many valuable inventions and improvements, some of which have been generally adopted in locomotive-building, and for them the inventor has received the highest encomiums in works on mechanics, until his reputation has become not only national but world-wide. Among his most important improvements, perhaps, were those in connection with the swing-truck and the double-ender locomotive. He has been credited with the original invention of the swing-truck, but this is wrong; it was the invention of Levi Bissell, at one time a mechanic employed at the Danforth Works, and A. F. Smith, Superintendent of the Hudson River Railroad. The object of the swing-truck is to enable a locomotive the better to pass around a curve and with greater safety from derailment, the engine being so swung that it is lifted and maintained in its position in reference to the train behind while the truck rounds the curve. But this was at first found to result in a lift of weight from the engine drivers and a consequent lack of adhesion. To overcome this Mr. Hudson introduced an improvement that consisted in placing an arrangement of equalizing levers between the two-wheeled truck and the front driving wheels, whereby both truck and driving wheels sustain their proper portion of the weight and accommodate themselves to the vertical as well as to the lateral motion required to enable the engine to pass over inequalities on the track and around curves with ease and safety. This invention was patented. Mr. Hudson also introduced a double-ender locomotive with two pairs of drivers, one pair at each end. One improvement of Mr. Hudson's, invented when he was still Master Mechanic of the Attica and Buffalo Railway, is highly spoken of. A great deal of trouble was experienced with leaky flues, and every few days some one had to go into the furnace of the engine to hammer or caulk up the ends of the flues and thimbles, the flues being then of copper or brass and the thimbles of wrought iron. In 1850 Mr. Hudson conceived the idea of substituting cast iron for wrought iron thimbles, as being more subject to expansion, which would result in correcting the evil, preventing leakage. He took a thimble of each kind, turned them accurately to a gauge, then heated them red hot, measured them and noted the expansion, then cooled them and measured again. This was repeated twelve times, when the wrought iron thimble was found to be appreciably smaller and the cast one larger, which solved the problem. Cast iron thimbles have since been in general use. Many other improvements might be noted, in the action of pistons, fire-boxes, grate-bars, ash-pans, safety-valves, etc., but the above is sufficient to show that Mr. Hudson was one of the most accomplished mechanics in the line of locomotive-building of his day; and he had thus been long regarded. About the time of his death a lengthy article in the *Railroad Gazette* was devoted to a sketch of his career and inventions; and in this a due meed of praise was awarded him as one most eminent among American mechanics. In social life Mr. Hudson was of a retiring disposition



and, like most men of his stamp, somewhat exclusive in his associations. He was usually found at his place of business or at his home. He was singularly pure in his domestic life and was idolized by his family and the comparatively few who became his intimate friends. Joppa Lodge, No. 29, F. & A. M., and Cataract City Chapter, No. 10, Royal Arch Masons, of which deceased had been a prominent member for over twenty years, being among the earliest to join, attended his funeral, the interment rites being conducted after the Masonic ceremonial.



CHAPTER XXV.

LOCOMOTIVE-BUILDING.—THE GRANT LOCOMOTIVE WORKS.

IN that portion of this work devoted to machinery it has been shown that in 1843 Samuel Smith, his brother William Smith, Judge Whitely and Thomas Beggs started a machine shop in the Franklin Mill; also that a short time afterward James Jackson and Patrick Maginnis bought the interest of Judge Whitely and William Smith and became partners, the firm name being Beggs & Smith, until 1844-5, when, Thomas Beggs dying, William Swinburne, City Comptroller of Paterson, whose distinguished career has been followed during his connection with the Rogers Locomotive Works, as Superintendent, became one of the company, the name of which was changed to Swinburne, Smith & Company.

Samuel Smith, who is a prominent figure in the history of several early enterprises, and who is still actively engaged in the iron business, had been a moulder at the Rogers Works; James Jackson and Patrick Maginnis, both very active and prominent citizens of that day, were the "Company," and were more especially noted as cotton manufacturers. The location of the works was just off Mill street, between John—now Ellison—and Van Houten streets, fronting the race; the size of the building 60x40 feet, two stories, of brick. For one or two years after the organization of the firm of Swinburne, Smith & Co., however, they occupied the lower story of the Jackson & Maginnis factory. This old building, afterward burned, was immediately adjoining the new building erected to accommodate an extension of the business.

A general machine business was done by the firm until 1848, when, on the opening of the Eastern Division of the Erie Railway to Owego, they gave up jobbing and machine-building and began to build locomotives. This locomotive works is consequently the second in order of establishment in Paterson, Danforth, Cooke & Co. not beginning to build locomotives until 1852. There were about 150 men employed during the first year of their locomotive-building by Swinburne, Smith & Co., and five or six engines were completed.

The first engine built at the works was for the Erie Railway Co. and was finished in May, 1848. In 1849 the firm removed their plant to what is now the main building of the Grant Locomotive Works, which was very much the same in appearance then as now, only that it bears the marks and stains of about thirty years'

use and action of the elements. The size of the building was 60x150 feet, three stories. The after extensions have been made toward the West. Here from 250 to 300 men were employed, and the firm conducted the locomotive industry with great energy, despite the fact that Swinburne, Smith & Co. endorsed heavily, to the extent of \$20,000 or more, for their two partners, Jackson and Maginnis, as manufacturers of prints, which brought the firm into great embarrassment. However, they weathered the difficulty and still prosecuted the business with vigor, turning out many locomotives, receiving three orders from the New York and Erie Company for ten engines each in close succession, also from other roads, until, in 1851-2, a charter having been obtained, the concern was incorporated under the name of the New Jersey Locomotive and Machine Company.

Mr. Swinburne was opposed to this change and marked his disapprobation by a withdrawal from the new company about six months later, and almost immediately he started a works of his own.

H. Uhry, a skillful and experienced mechanical draughtsman and a very accomplished gentleman, a native of France, succeeded Mr. Swinburne in the direction of the locomotive-building at the company's works. Mr. Uhry was an inventor and became widely known through his valuable improvements to the cut-off, applied with success to stationary engines; also in connection with other improvements. Messrs. Smith, President, and Jackson, Vice-President, controlled the stock of the company, Mr. Maginnis being the weaker of the original firm. The old incubus connected with the operation of the cotton factory still rested on the partners, and Mr. Jackson held a bare control in the company. There was much litigation and great embarrassment, Mr. Swinburne, the retiring partner, losing several thousand dollars through being involved, as endorser, with the firm of Jackson & Maginnis. Much of the stock found its way into the market during the few years that elapsed after the incorporation, and finally Oliver D. F. Grant and his son, D. B. Grant, then bankers and brokers in New York, secured a preponderance, a new charter was obtained and Mr. Grant, the elder, was elected President of what was then and has since been styled the Grant Locomotive Works.

Mr. Jackson went out of the company with but little, Mr. Smith sold out and Mr. Maginnis also went out, as represented, with much less than any of the others. Mr. Grant, the new head of the establishment, was a bright, energetic and talented man of business, and under his direction the after operation of the concern was remarkably successful. It was at this works a few years later that the famous locomotive "America," exhibited at the Paris Exposition in 1867, was built, and the proprietors were awarded not only medals but great honor for the magnificent monument of American skill in mechanics, which, as represented by this world-renowned locomotive, was thus brought to the notice of all nations.

The "America," though no better in construction than many others turned out from the Paterson shops daily, was so superb in all its details, so elaborately finished, with polished metal, silver mounting and native woods, that it was regarded, and justly, as a marvel of beauty, as well as unparalleled as to its mechanical proportions. It was a veritable poem in iron and steel and silver, and "it rang

the pæan of American progress, with a rhythm and power that commanded the ear of all the world." Said the Rev. Dr. Prime: "It was the most majestic single contribution to the Exposition." This was high praise, but deserved.

In speaking of the "America" as exhibited at Paris, *The Engineer*, published in London, said:

"The passenger locomotive exhibited by the Grant Locomotive Works, of Paterson, N. J., is doubly interesting, inasmuch as it is the first locomotive sent by the West to the East and is typical both of the wants of a still new country and the general design which experience has suggested for meeting them. The engine presents an appearance most striking to English and, in fact, to European eyes. Elaborately ornamented, highly and thoroughly well finished in every detail, it is a worthy climax to the extremely interesting collection of machinery furnished by the United States to the International Exhibition."

An illustration of the hearty admiration evinced by the Paris press is given in a brief extract from a long article in *La Liberte* upon "*La Locomotive Americaine*":

"Mr. Grant, of the Paterson Works (New Jersey), is one of the ablest constructive engineers in the United States, and his locomotive, for which the jury has decreed a 'grand' gold medal, is one of the finest objects on exhibition at the Exposition. Those who have examined and marveled at it cannot fail to retain it everlastingly in memory. If America has not obtained the great prizes for its illustrations of the fine arts, painting, sculpture, etc., it has everywhere stood in the front rank in all that relates to the great industries, machinery and those practical things over which it has empire and will always encourage."

Up to 1859 the number of locomotives turned out from the works was 225, of which 70 were for the Erie Railroad, many of them being among the finest and most powerful machines on that line. The number of employes engaged in 1859 was 170; capacity of the works about 30 engines per annum, although but 20 were actually finished in 1859. Besides engines, railroad machinery, such as boilers, lathes, tools, etc., was made. In 1867-8 the works covered an area of five acres, employed over 600 men and had a capacity of 50 to 75 complete first-class locomotives per annum.

The highest point was reached in the prosperous career of the company in the year 1873, when 130 locomotives were built. The record for this year shows a total disbursement for wages of \$541,577.18, which sum was paid to 744 men. These were the palmy days of the locomotive industry in Paterson, followed by a period so dark and so full of privation and discouragement among the sturdy men who had been accustomed to transmute gold out of the stubborn iron and steel that it seemed as though the good times longed for would never return. The lowest point of depression was reached in 1875, when but ten engines were built and the working force consisted of but 18 men, to whom was paid a total of \$4,701.93 in wages. In 1876 it was scarcely better, only 12 engines being built. In 1877 25 engines were turned out, 40 men were employed and \$12,291.41 was disbursed in wages. From that time there was a gradual recovery, as may be seen by reference to the table following, showing the yearly production. In 1880 there were 57 engines built, besides repairs to the Erie engines; 457 men were employed and \$251,505 was disbursed in

wages. In 1881 111 engines were built; 675 men were employed, to whom \$338,500 was paid. The total product aggregated in value \$950,000.

Following will be shown the total product for each year from 1848 to 1881, inclusive, and again it will be seen, as in the statistics of the production at the Rogers Works, how the several periods of depression affected the business of locomotive-building and the length of time that elapsed before recovery :

1849	-	-	6	1858	-	-	16	1867	-	-	48	1876	-	-	12
1850	-	-	10	1859	-	-	20	1868	-	-	57	1877	-	-	25
1851	-	-	14	1860	-	-	24	1869	-	-	100	1878	-	-	46
1852	-	-	18	1861	-	-	31	1870	-	-	101	1879	-	-	31
1853	-	-	24	1862	-	-	40	1871	-	-	96	1880	-	-	57
1854	-	-	35	1863	-	-	45	1872	-	-	111	1881	-	-	111
1855	-	-	40	1864	-	-	50	1873	-	-	131	....	....	....	....
1856	-	-	42	1865	-	-	53	1874	-	-	60	....	....	....	....
1857	-	-	33	1866	-	-	58	1875	-	-	10	....	....	....	....

This gives a total of 1,555 locomotive engines turned out at these works, the proprietors of which entered the field about a decade after the pioneer of the industry, Mr. Rogers.

The total number of engines built, if estimated at the same average value fixed upon in connection with the Rogers product, to wit : \$15,000 each, would give an aggregate sum of \$23,325,000 as the total value of the locomotives turned out in the past 33 years ; the total amount disbursed in wages for locomotive-building in this period is estimated at \$9,750,000 in round figures. The works of the company at the close of 1881 comprised seventeen distinct buildings, the total flooring space being 205,000 square feet. The officers of the company are : R. Suydam Grant, President ; William W. Evans, Secretary and Superintendent. Peter Arnott is Master Mechanic.



CHAPTER XXVI.

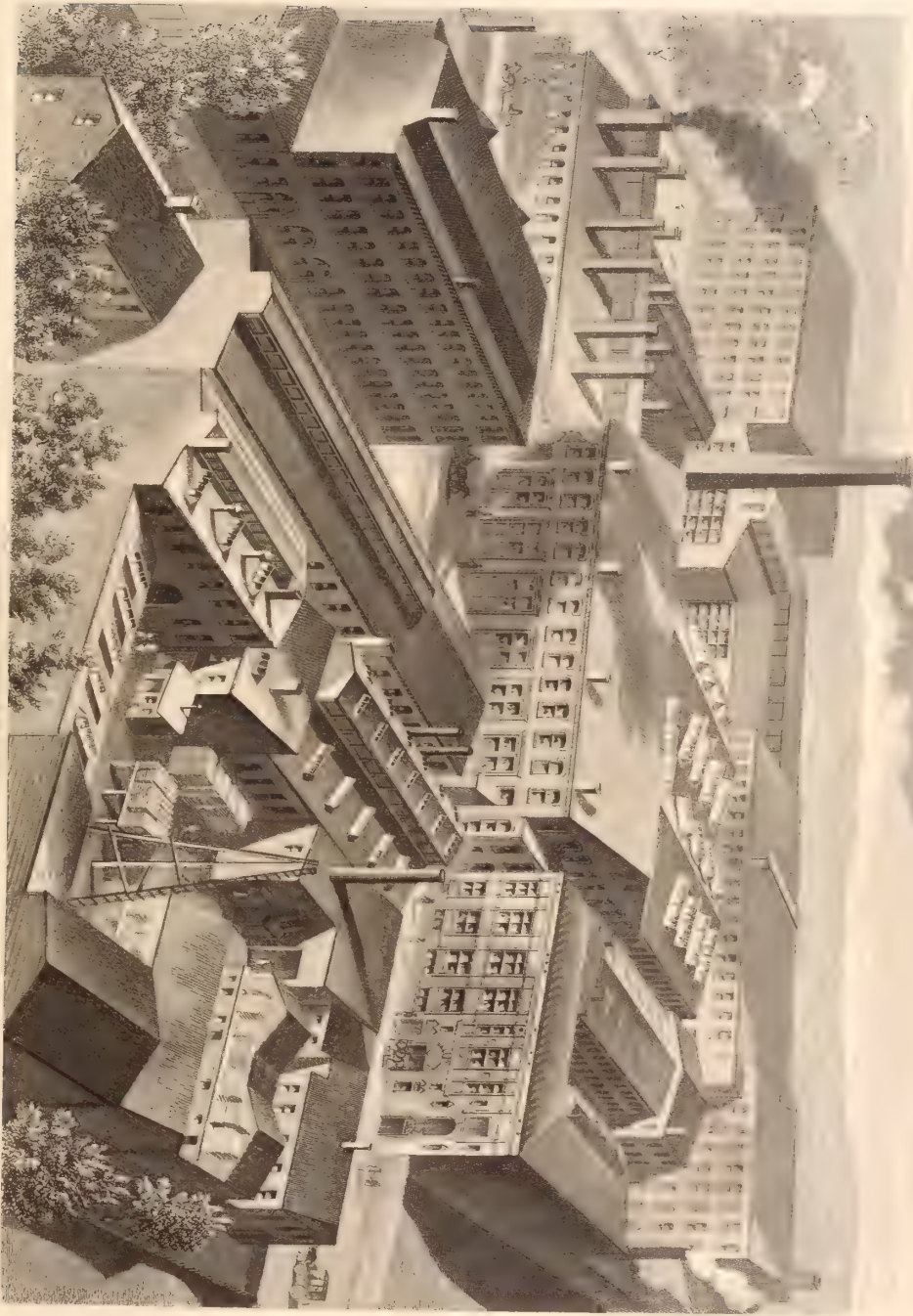
LOCOMOTIVE BUILDING.—THE DANFORTH LOCOMOTIVE AND MACHINE WORKS.

THE firm of Charles Danforth & Co., which remained unchanged from 1848 to 1852, was composed of the late Charles Danforth and John Edwards. It has already been shown how this, which is now among the largest and most important locomotive and machine-building establishments in the United States, originated in a small machine shop erected by John Clark, the elder—the first machine shop in Paterson and, probably, the first in New Jersey—about the year 1800, on the site of the old Bachmann Mill; also, how, in subsequent years, the enterprise grew in importance, and that, one after another, Thomas Rogers, Abraham Godwin and Charles Danforth were connected with it and directed its operations with the remarkable skill, energy and executive ability which promoted its continued success.

In 1852 the business was extended and the building of locomotives was commenced in addition to that of machinery and the cotton manufacture. At this date two new partners were admitted, Edwin T. Prall, who had been principal book-keeper since 1839, and John Cooke, who had been Superintendent of the Rogers Locomotive Works for six or seven years, succeeding William Swinburne, as before noted. The firm was re-organized under the name of Danforth, Cooke & Co., which was continued until 1865, when, a charter having been obtained, the Danforth Locomotive and Machine Company was incorporated, the old partners being the principal stockholders. A brief sketch of the general situation and the circumstances under which the business of locomotive-building was commenced at these works may not be out of place just here; also of the enterprising and capable men associated for this purpose.

It has been shown how John Cooke had worked his way upward from a poor boy by the force of intelligence, industry and integrity until he occupied a prominent position as director of one of the very first among American industries. He is conceded by historians and others (see Bishop's *History of American Manufactures*, Vol. III, page 226) to have contributed greatly toward perfecting and giving character to the magnificent engines turned out by Rogers, Ketchum & Grosvenor, and now we find his great ability and remarkable business talent transferred to the

View of the Lowell Manufacturing District from the North



firm wherein he became partner, the productions of which—as of the company into which it afterward merged—have borne his impress, as to character and excellence, even to the latest locomotive engine and the latest piece of machinery completed at this vast establishment.

John Cooke was born at Montreal, Canada, whence his parents removed while he was yet very young to Albany, N. Y., and from thence, about five years later, to Matteawan, Dutchess County, N. Y. Here, while he was still but a small lad, John was accustomed to visit the cotton mills and watch the workings of the machinery with curious and critical interest. He was scarcely fifteen years of age when his parents removed from Matteawan to Paterson, where his father, Watts Cooke, Sr., found employment as head pattern maker at the locomotive and machine works of Rogers, Ketchum & Grosvenor. A year or two later he was taken into the shop and spent several years in learning the trade, devoting his evenings to hard study. His early educational advantages had been superior, for that period, but he was thirsting for knowledge and during many years spared not the midnight oil. He was especially fond of mathematics and was also a great student of history. Continuing his studious habits even far into manhood, he garnered up a store of valuable information on practical subjects such as few possessed, even of those who were favored with all the advantages of ample leisure and abundant instruction. It is related elsewhere how he rose from one position to another in the Rogers establishment until, when scarcely of age, he was intrusted with the entire superintendency, succeeding Mr. Swinburne upon his retirement therefrom. This position he retained until, in 1852, he became one of the firm of Danforth, Cooke & Co. Of his after career in the direction of this great industry the details will be found inseparably connected with the prosecution of the business in succeeding years. This is more especially a digressive personal sketch.

After devoting himself very closely to business, almost day and night, until about 1866 Mr. Cooke felt the need of a period of rest. He had long desired to visit Europe and other countries, and he now decided to gratify this reasonable longing. His entire family accompanied him, and his children were placed in an excellent school on the Continent. The family spent three years abroad and during that time not only visited all the countries in Europe, but also paid a visit to Palestine and took a trip up the Nile. Having satiated the desire for travel they returned, and upon the retirement of the late Charles Danforth from the presidency of the Danforth Locomotive and Machine Company Mr. Cooke was chosen to succeed him, remaining in the position until his death, February 20th, 1882, at the age of fifty-eight.

At the age of eighteen Mr. Cooke became a member of the Congregational Society, but subsequently united with the Second Presbyterian Church, in which he remained an active and consistent member until his death, holding offices of trust and responsibility therein for many years. He was, besides, most active in promoting the growth and advancement of Presbyterianism, and of religion generally, in the city, his being an especially catholic spirit. In politics he was a Republican, and, being of strong convictions on this as on other subjects of importance, he was active and zealous, though never, in the common acceptance of that

term, a politician. In dying he left a wife, the daughter of City Comptroller William Swinburne, and five children, two married daughters and three unmarried sons, the two youngest still at school. The general sentiment throughout the city in reference to his demise was that there was no other citizen whose death would have left so large a void and whose place in the various departments of social life and business activities it would be so difficult to fill.

Charles Danforth was not at any time especially active in the locomotive-building department; his forte was cotton and other machinery. Mr. Danforth was accounted the most accomplished manufacturer of cotton machinery living, his experience having been wide in all branches of the industry, so that he had mastered every detail and was thoroughly conversant with everything relating to cotton-spinning and the building of machinery for that purpose. Since his invention of the spinning frame with which his name has ever since been associated he had made many improvements on it, until it was at this date regarded as the most effective throstle spinner extant and would produce, it is claimed, fully thirty per cent. more yarn, "spindle for spindle," than any other. Mr. Danforth was a deep thinker and reasoner. He had a wonderfully retentive memory. When he undertook to study a subject or examine a piece of mechanism he did not abandon it until he had mastered it in fullest detail. He was slow in coming to a decision, but his conclusions were generally correct. Scrupulously exacting in business matters, demanding and paying every cent, among prominent business men of New York, with whom he had large dealings, he was held in high esteem for his probity. He died in 1875, aged seventy-nine years.

The late John Edwards was in special charge of the cotton machinery manufacture of the concern, his duties being mainly in connection with that branch. The cotton mill on the race, a portion of the walls of which still remain, and which was, and is still, known as the old Collett Mill, the same building wherein Godwin, Rogers & Co. commenced business, was superintended by Mr. Prall. The first floor was occupied as a machine shop, the three upper floors as a cotton factory, for prior to 1852 the business of the concern was confined almost or quite exclusively to cotton and cotton machinery, these two departments of manufacture being naturally combined in those days.

John Edwards was born in England and came to this country when a boy. His mother and step-father settled in Bloomfield, N. J. John, while still young, came to Paterson. He worked for a Mr. Van Bussum, who kept the Franklin House, where he gained the notice of John Clark, who took him as an apprentice to the machine business. He was a faithful apprentice. Messrs. Rogers and Clark thought very highly of him, ultimately making him foreman of the shop, which position he retained under Mr. Danforth, whose partner he finally became. He was very orderly and systematic in all his business, having a place for everything and everything in its place. In his intercourse with the men under him he was firm, always just and liberal, and commanded and retained their highest respect and esteem. In early manhood he was fond of military matters and held a major's commission from the State. He died in 1878, aged about seventy-two, leaving as the only surviving partner of the original firm of Danforth, Cooke & Co. John



John Cooke

Cooke, the oldest locomotive builder actively engaged in the business from that date until his death in 1882. During the partnership of Messrs. Danforth and Edwards the former held a nine-tenths' interest, the latter one-tenth. Although the business as carried on by Charles Danforth & Co. up to 1852 was very remunerative and the concern prosperous, there were periods of great stagnation, when there was little or no demand for the product.

Edwin T. Prall, a gentleman of remarkable energy and invaluable to the firm, not only served as bookkeeper and superintendent of the cotton factory there, but had a partnership with Mortimer Hall, and together they ran a cotton mill at or near Godwinville, and Mr. Prall used to walk up to this village and return every week, to look after the business and make up the accounts. His uncle, the late Abram Prall, had been partner with Abraham H. Godwin, a nephew of Gen. Abraham Godwin, of Godwin, Clark & Co., and the firm carried on the cotton manufacture in a portion of the old Gun Mill from about 1845 to 1852. Here, also, Edwin T. Prall, the indefatigable, found employment in writing up the books at odd hours. Mr. Prall was aged about thirty at this time, and his capacity for work seemed well nigh illimitable; in fact anything like idleness wore upon and fretted him.

Mr. Prall came from Staten Island and was of good old-fashioned Knickerbocker-Moravian ancestry. Left an orphan when young, he was thrown on his own resources. While a boy he found employment with his cousin, David Prall, an importer of drugs in New York city. He was at another time employed by his uncles, Peter and Henry Prall, cotton manufacturers at Haverstraw, N. Y. Later he came to Paterson to take a place in Charles Danforth & Co.'s office, under his uncle, "Abe" Prall, who was bookkeeper for the company, and after his death he succeeded to his place. Mr. Prall was very social in his disposition, made many friends among railroad men and had no superior in looking up orders. At twenty-four years of age he married Rachel Thompson, a young lady of excellent family. In the later years of his life he was among the most prominent citizens of Paterson socially, politically and otherwise. He was twice Mayor of the city, being elected first in 1860; at the expiration of his term of office his name was placed on the tickets of both political parties, there being no opposition to his re-election. He was commissioned Colonel of the Second Regiment of the Passaic Brigade, General T. D. Hoxsey commanding, early in the war of the Rebellion, and tendered the services of his command to Governor Olden for the war, who declined in a letter couched in the most flattering terms, the quota from the State being at the time complete. He died in 1869, at about forty-nine years of age.

It was during a period of semi-depression in the business of Charles Danforth & Co., in 1852, that this active bookkeeper and general factotum—for he made himself busy in any department where he could find vent for his superabundant vitality—became restive, and one day he declared that he would resign. He was promptly told that he must do no such thing, and, when he persisted, a partnership was offered him. "No," said he, thoughtfully, "there's no money in it." Afterward a sudden idea struck him and he said to the partners: "If you'll go into the locomotive business I'm with you." To this two very natural objections were made; there did not seem to be any one capable of directing the work, and there might be a dif-

ficulty in obtaining orders. The energetic bookkeeper declared confidently his ability to find both the man and the work. The partners took a brief space for consideration, and then Mr. Prall was told to "go ahead."

He went ahead at once and after his characteristic manner. John Cooke was superintending the locomotive department for Rogers, Ketchum & Grosvenor, where he was receiving the then very liberal salary of \$1,800 per annum. He was invited to meet Messrs. Danforth, Edwards and Prall at the house of the latter, and when he came a proposition was made to him to become a partner, with Mr. Prall, in the concern. He could not readily make up his mind. He had so identified himself with the Rogers Works as a builder of locomotives that it seemed difficult to wrench himself from his place. However, regarding it as time for him to make some advancement, he laid the matter frankly before Mr. Rogers, who declared in his impetuous way that he should not go. He could have a partnership there. Mr. Grosvenor also said very emphatically he must not think of it; he was regarded as one of the fixtures of the establishment. Pending any further action Mr. Rogers went away for a considerable space, and in his absence the to-be rival establishment pressed Mr. Cooke to enter into the copartnership and, the other matter being still in doubt, he committed himself. After it was done he was greatly disturbed over it. When Mr. Rogers returned he laid some papers before the Superintendent, saying, "Now look these over and sign. These give you an interest with Rogers, Ketchum & Grosvenor." Mr. Cooke ran his eye along as far as, "This indenture," and then stopped, saying he would read no further. He had already decided; he had joined the other firm. "Oh, very well; very well," was the irritable reply; "it can't be helped, I suppose." Mr. Rogers did not like to lose his efficient Superintendent but said little more about it.

The new company organized July 19th, 1852, and they broke ground for their new shops about the first of August following. It had been the intention of Danforth, Cooke & Co. to merely supplement their machine-building with the locomotive business, utilizing as far as practicable their old shop and tools in the new enterprise. The works at this date included the brick machine shop, end facing on Market nearly opposite Jersey street, 30x134 feet, four stories high; the old Collett Mill, on the rear of the lot, 50x72 feet, four stories, three of which were being used by the company as a cotton factory; a blacksmith shop, 24x105 feet, on the same lot, adjoining the Hamil Mill lot; also, on the opposite side of Market street, a frame foundry, 50x75 feet, about one-quarter the size of the present one. In addition to these there was in use a building on the rear of the lot adjoining the machine shop, known as the "Munson Godwin lot." This building was 40x75 feet, three stories. It was built fully sixty years ago by the late Aaron King, who brought the material, trap rock, in a scow on the middle canal from the hill back of the Ivanhoe Paper Mill; this was used as a millwright and pattern shop.

It was intended to build the new locomotive shop on the Munson Godwin lot, which had a frontage of 100 feet on Market street and extended back to the middle canal, joining on the West the property of James Shepherd, the veteran cotton-bleacher, which had a 200 feet frontage on Market street, extending to the line of the present Grant Works. Shepherd had leased one-half of this lot, known after-



Edwin Hall

ward as the Jaffray Mill lot, to Thomas Rogers, who was running a cotton mill on the rear of the lot. It was found when the Munson Godwin lot was surveyed that Shepherd's building was over the line about three feet. The new firm purchased the entire property for \$11,000; two feet of water, one on each lot, at a rent of \$500 per foot per annum, went with the property, and it was considered very cheap, but Mr. Shepherd had referred the firm to his counsel, the late Daniel S. Barkalow, and that was the price he fixed on it.

This lot was a very important addition to the property of the new firm, enabling them to put up buildings for what at that day was considered a large works. Their main building, for an erection shop, was 100x50 feet, with a wing running back 60x45 feet. Both were two stories. Connected to this building was a one-story blacksmith and boiler shop in the form of an L, with a frontage on Market street of 75 feet and extending back to the middle of the canal about 150 feet, with a width of 48 feet. The buildings on both sides of Jersey street were afterwards added, one of them within a year or two after starting the works, as it was found that the blacksmith and boiler shop was too small to accommodate both branches. These buildings were erected by Cornelius Vreeland, mason, and Andrew Derrom, carpenter, and were considered the best adapted for a locomotive works of any in the city. The large chimney, over one hundred feet high, was built in connection with underground flues in the blacksmith shop for carrying up all the smoke and sulphur from the shop. The buildings were heated by steam and had, when complete, a capacity of from four to six engines per month.

Early in August Mr. Cooke left the employment of Rogers, Ketchum and Grosvenor and devoted his whole time and energy to the building up of the new enterprise. Special tools had to be made under his supervision, as the manufacture of tools for locomotive work was not then largely a specialty as now. Those not made by the company were ordered from Lowell, Worcester and other places East; nearly all of these were destroyed in the great fire in 1879.

By early Winter the buildings and tools were ready to commence work. The first order was for five locomotives from Seymour & Co., for the Ohio & Mississippi road. Seymour had been Chief Engineer on the New York & Erie road and had a contract to build the Ohio and Mississippi road from Cincinnati to St. Louis. The first engine finished was named "Vincennes." This was an unfortunate contract for the new beginners. The bankers of Seymour & Co., Page & Bacon, of St. Louis, failed and were not able to meet their notes given in payment for these engines, but ultimately the company received bonds for the notes, which bonds many years afterward appreciated in value so that the loss was not a total one. But the first locomotive actually delivered was completed in March, 1853, and was for the Junction road in Ohio. The name, by a singular coincidence, was the "Sandusky," the same as that of the first engine turned out from the Rogers Works.

There was then, as there is at this date, a friendly rivalry between the shops, and care was taken not to induce the hands to leave one shop for the other. John Cooke says it was uphill work to collect hands acquainted with locomotive work. A younger brother, William, since engaged in business in New York city, took charge of the draughting at the new works; Watts, now President of the Passaic Rolling

Mill Co., who was then a little over nineteen years of age and a bound apprentice to Thomas Rogers, had been sent to Cincinnati to put up three new engines for the Cincinnati, Hamilton & Dayton road. When he came home and found the change that had been made, he had a great desire to cast in his lot with his brother John and proposed to Mr. Rogers to buy the balance of his time. Mr. Rogers consented, taking the young man's note, to be paid in a year, which note, by his advanced pay, he was able to take up long before it came due. He was installed as foreman of the erecting shop, in which capacity he remained until 1854, when he was sent to Scranton to look after a coal-burner engine that had been sent to the Delaware, Lackawanna and Western road, and the Superintendent of that road, being pleased with him, engaged him as master mechanic, at a salary that his brother's firm did not feel able to pay. James Ayres, a fellow apprentice with Watts Cooke, was given his place, which position he has occupied for nearly thirty years.

Prior to 1857 the railroad business was very prosperous and work flowed in so that the new concern was taxed to its utmost to fill the orders received. These orders were largely from the immediate vicinity and included a number secured through E. & A. Stevens of Hoboken, for the Camden & Amboy road; from John P. Jackson, President of the New Jersey road; through Judge Vail, for the Morris & Essex road and through Director Sprague, a relative of Mr. Prall, for the Delaware, Lackawanna & Western, for engines to be used on their road from Scranton to Great Bend on the line of the Erie, the idea then being that other lines of transportation would supply the East with coal from the Pennsylvania coal-fields, the Delaware, Lackawanna & Western aspiring to transport the mineral product of the Scranton region to the West, where it was thought there would be an excellent market. Since that time the greater number of engines used on his road have been built at these works.

Orders were received at the works from Mexico also. The first engine was sent out with Col. Talcott, an American engineer who had surveyed the Vera Cruz and Mexico Railway. He took some Paterson workmen along to assist him with the engine, which was taken to pieces and hauled over the mountains to the City of Mexico, to be used on that end of the road. The work of building the road dragged along slowly, as most enterprises did in that country, and finally fell into English hands.

Under the rule of Maximilian two more engines were sent to a road near the City of Mexico. One was called "Carlotta," after the unfortunate Empress. A man named Ferry was engaged to go out with and to set them up and to run them. A section of the road was to be opened with a great fete, at which the Emperor and Empress were to be present in state. But the locomotives were on the other side of the mountains and it was considered impossible to have them over in time. Ferry, however, was equal to the emergency. Making a strong wagon and impressing all the oxen he needed he brought the engines over and had them both in order for the opening of the road. The Emperor and Empress publicly thanked Ferry and his men for what they had done. The engines were smothered with garlands and after consecration by the priests proceeded to take their respective trains. Ferry was unfortunate in the end. His wife died in Mexico, and when the Emperor was

executed he had to leave, making his escape from the country on board a small sailing vessel, leaving behind everything he had.

Among the early productions of Danforth, Cooke & Co. were locomotives for Texas, probably the first sent into that State. They were ordered by James Wells, a brother of Mr. Wells of Muzzy & Wells, at that time lumber dealers in Paterson. Several were sent to Texas in 1860, and fell into the hands of the Confederates, and were destroyed and were never paid for.

An American company undertook to build a road in Venezuela from Laguayra to Caracas, when, through some revolutionary movement, such as are chronic there, the company failed, leaving the locomotive on the beach, where it had been tossed from the vessel, the Danforth Company losing all they had invested and the men sent out to set it up getting away with their lives barely.

During the seven years which followed the organization of Danforth, Cooke & Co. over 160 locomotive engines were turned out for various roads. In 1859 the concern comprised, in addition to the cotton factory, a foundry wherein 100 hands were employed; a machine shop, employing 175 hands; also a locomotive, boiler and blacksmith shop, wherein about 250 skilled and muscular workmen, begrimed with the smoke and dust of remunerative labor, daily contributed in making the vicinity about the terminus of Market street a place of deafening clangor caused by steel smiting steel, and filling the atmosphere with metallic particles, the ears with a metallic din. The capacity of the locomotive shop at that date was rated at 35 engines per annum. The foundry cast about five tons daily. This was in addition to the machine-building department, except as to the product of the foundry, which cast for both. The entire sales of the establishment had averaged over a half million annually for several years.

In 1867, two years after the incorporation of the Danforth Locomotive and Machine Company with Charles Danforth as President, the works covered nearly two acres of ground and included a cotton factory, a foundry, a new boiler shop, 200 feet in length, a large blacksmith shop and pattern shop, 110x35 feet, in which valuable patterns were stored, costing originally over \$150,000, a machine shop and a locomotive shop. The product at this time had reached as high as \$300,000 worth of cotton machinery and seventy locomotives in a single year, and the establishment employed as many as 700 men in the various departments. From that date until 1873 there was a steady increase in prosperity; then the reaction which came to all American industries and to all business struck this establishment also, and a death-like quiet reigned throughout the vast works, not only of this company but of the others, at the head of Market street. A blow had been struck from which the iron, in common with other industries, was slow to recover, and it was not until about 1879-80 that a return of something like the good old times was welcomed with joy by the skilled artisans employed in this department of labor.

About the year 1854 the question of coal-burning engines was for the first time being discussed at Paterson; in Pennsylvania and Maryland they had been in use for a short time. The Delaware, Lackawanna & Western Company, having a terminus at the coal-fields, desired to burn coal. The only engine that had been built for the purpose anywhere in this section, so far as there is any record, was a queer-

looking nondescript, bearing much the appearance of a steamboat on wheels, built by one Tripp, at Trenton, and run on the Camden & Amboy road. It was not a success. Danforth, Cooke & Co. had built four wood-burning engines for the Delaware, Lackawanna and Western, and they then received an order for and turned out a coal-burner, and dubbed it the "Anthracite." When completed there was a competitive test at Scranton, between the "Anthracite" and one of what were known as the "camel-back" coal-burning engines sent up by Ross Winans, from Baltimore. Winans' engine was a trifle heavier, and was a very good engine. The test was a close one, including the feature as to economy in fuel. The men in charge burned everything clean, even to an ounce of coal dust and the last cinder, as the fuel was carefully weighed out to them. When the test was concluded a decision was reached as to the best coal-burner, and it was not a "camel-back." The "Anthracite" was the first coal-burning engine ever built in Paterson, and many locomotive-builders and others had no faith in them. In England coal was first coked before using it in their locomotives, and it seemed to be the general impression in this country that it could not be used; that it would be fatally destructive to the fire-boxes. On the day of a trial trip on the New York & Erie of the first coal-burner made at the works of Danforth, Cooke & Co., at which were present George D. Phelps, President, and some directors of the Delaware, Lackawanna & Western Company, a prominent locomotive builder of Paterson was met at the hotel and invited to be present. "It'll never do," said the pioneer engine builder; "coal will burn out all the fire-boxes. Better stick to wood." But it did do, and coal-burning engines are now in general use. The coal-burning engines turned out at Danforth's were a success, and the style adopted later is still in use. The "Anthracite" had been turned out and was on her trial at the very date of the greatest flood ever known in Paterson, in 1854, and the same day when the disaster occurred to the "Ericson" steamer, driven by caloric, in New York harbor.

The mining of coal involved a great deal of shifting of cars, the hauling away of full and replacing them with empty ones in making up of coal trains ready for starting from stations. For this work an engine of the usual construction is too cumbersome, which led to the planning by Mr. Cooke, in 1855, for the Delaware, Lackawanna & Western road, of a special engine for that purpose. It was without a tender, water and fuel being carried on the engine. It was dubbed by some one a "bobtail," by which name this style is still known on the road. It answered the purpose so well that ten more were ordered during the year, and many others afterward.

Many roads passing through a thinly settled country, with but little business, failed to pay any profits; sometimes hardly the expenses of running. A great expense was caused by the heavy locomotives destroying the light, cheap tracks in use. This led to the construction of an engine and tender combined, with one pair of drivers and a truck front and rear. This style, with but two pairs of drivers, was afterward patented. About 1855 two of these light engines were sent to the Macon & Western road, Georgia. Another, the "Reindeer," went to Cleveland, and received most favorable notice for its speed, efficiency and economy. Two were sent to the Troy & Greenbush, a branch of the Hudson River road. Many other

short roads received them. They were a success, just suited to a road in its infancy.

There is hardly a style or size of engine known to this country, from eight to fifty tons weight, from two to eight drivers, from a 30-inch to a 72-inch gauge, that this firm have not made; wood, coal and culm, or coal-dust, burners. Every State in the Union except a few of the New England States; every country on this continent, and nearly every State in Central and South America have received the locomotives of this company.

Among the novel engines made by the company were the dummies used for hauling freight cars from the Vanderbilt or Central freight depot in Hudson street to Thirtieth street, New York. These were made about 1863 and are on the Fontaine principle reversed, the engines driving a friction wheel which reduces the speed, and increases the power. After nearly twenty years' experience they have proven to be a success for the purpose for which they were made.

About 1857-8 Messrs. A. L. Holly and J. H. Fisher, the former now a scientific adviser in the manufacture of Bessemer steel, and both at that time men of great scientific attainments (the latter being an artist and a monomaniac on the subject of steam-carriages), came to Danforth, Cooke & Co. to have built a steam road-wagon, or a peculiar kind of passenger "dummy" for use on a common highway. If successful, this wonderful invention was to sweep from the streets of New York all her omnibuses, and, perhaps, what comparatively few street cars were already running. It was also intended to establish a line of steam-wagons across the Isthmus of Tehuantepec, each to carry twenty-four passengers at least. The drawings were furnished and all needed instructions given, and a specimen wagon was turned out. It was run up Market street one night about 10 o'clock to test it, and demolished pretty nearly every tree-box and awning-post on its way. Turning down Main street, the steam-wagon ran directly into the front of Lockwood's tailoring establishment, smashing things right and left. Miss Lockwood, who was about to retire, drew the curtains of an upper window, peered out cautiously upon hearing a strange noise, and saw what filled her with affright—a terrible looking monster bearing down directly on the house. She looked again and then ran down stairs shrieking, "Father; father; here's a locomotive run away and it's coming straight in the house!" A few days later the steam-wagon was taken to Jersey City ferry, where it crossed to New York, arriving about midnight. Mr. Fisher and the men in charge steamed up and started up West street in gallant style, but in essaying to turn into Fulton street at Washington Market, a sharp corner, being an acute angle, the steam road-wagon came to grief; it "missed stays," couldn't "luff," or wouldn't answer to the helm, and in consequence went crashing into the corner of the market, and was reduced to a wreck. It was never a success.

It is interesting to note some of the improvements made in locomotive construction during the thirteen years' service of John Cooke at the Rogers Works. Wooden frames gave way to iron; cabs for the engineers, cow-catchers, steam gauges, heater-cocks and pipes for heating the water in winter, sand-boxes and head-lights—all these, if required, were for a long time specified in the orders and were paid for as extras. Four and six drivers were adopted, instead of but one pair.

But the greatest of all improvements was made in the valve motion, by reason of which great economy in fuel and increased speed were obtained. Up to about 1844 a simple slide-valve was used for the admission and exit of the steam to the cylinder, and this could be made to answer very well on level roads and with light trains, but on undulating grades, of which there are many in this country, it was found necessary to have some plan to regulate the admission of steam to the cylinders while the locomotive was in motion, to suit the changes of grade and load.

This was first accomplished by the adoption of what was known as the "cut-off," a device by which the steam was cut off from the piston during a partial stroke, allowing it to complete the stroke by the expansion of the steam, the whole to be thrown in or out of gear at the pleasure of the engineer. The result was a wonderful economy in fuel and a capacity for speed almost unlimited. This plan was generally adopted, although it added much to the complication of the machinery.

In 1842 the "link-motion" was brought out by Robert Stephenson, of Newcastle, England, on one of his locomotives. Although called the Stephenson link, it was claimed by a man named Williams, a gentleman apprentice of that establishment, as his invention. About 1847 Mr. Hodge, who has been referred to in a former chapter in connection with the building of the "Sandusky," at the Rogers Works, sent over from England a drawing of this link. Mr. Rogers brought the drawing to Mr. Cooke, who produced a model so that the movements of the valve affected by it could be exactly defined. Mr. Cooke said that Mr. Rogers and himself stayed in the shop until "the sma' hours" night after night, studying and working the model, which in time was applied by Mr. Rogers to a locomotive for the Eastern Railway, of Maine, about 1848 or 1849; also, about the same time, to an engine for the Hudson River road, which was just opened to Poughkeepsie. But it met with decided opposition from the master mechanics of the roads; they were used to the "cut-off" and did not understand the "link;" did not believe it was a "cut-off anyhow." While theoretically not as perfect as the independent "cut-off," yet this device, by reason of its extreme simplicity and the facility by which the amount of steam is regulated to the work to be done, has come into general use. It is at this date practically what it was when first brought out forty years ago; the same device, without any improvement. Although so necessary to the success of the locomotive, this, in common with the tubular boiler, equally important, has never been the subject of a patent, but has always been public property.

There is a remarkable system in the arrangement of the tools and machinery at the Danforth Works, and the orderly appearance of everything about the vast establishment strikes the visitor with amazement. Here are tools costing thousands of dollars each, the best in the world for the work to be done with them. The templets in use are a marvel to all skilled machinists who understand their wonderful perfection and true value. The arrangement in the various departments is such that there is a regular progress of the material from bench to bench, from point to point, until each separate part is finished in its course and all portions are brought together and the result is a completed engine.

The Danforth Works enjoyed a remarkable immunity from disastrous fires—the only fire of consequence being that which burned the attic off the cotton mill, in

1844—until March 6th, 1880, when a fire occurred that destroyed the locomotive erecting shop, the blacksmith shop and the shop where the driving wheels of locomotives were made. The loss aggregated \$100,000, the insurance \$70,000. The burned buildings were soon rebuilt, so that all departments were in full operation again in an incredibly short space—which was largely owing to the tireless diligence and remarkable energy of Superintendent James Cooke, a brother of President John Cooke, whose health unfortunately was quite broken down under the great strain he subjected it to, so that he has been more or less of an invalid from that date. Not only were the burned buildings replaced, but large additions were made, so that the establishment was soon in better condition than before the fire. Bridges over the streets at the second stories were constructed, connecting the most important of the different departments. These obviate the necessity of conveying pieces of work down to the street and across and hoisting them to the place where wanted. Besides, a great deal of time is saved to workmen in crossing from one building to another. It is in contemplation to build largely in the near future, among other additions projected being a large front building of brick, on the site of the present frame office, about 100x30 feet, two and three stories, for offices, drawing rooms, etc.; also, a large building East of the last-named, toward the Hamil Mill, and extending back toward the blacksmith shop; this to be three or four stories in height and to be occupied, in part at least, for working in wood, pattern-making, etc. Other improvements and additions also are planned, which will when completed greatly facilitate operations, increase the capacity of the establishment and render the works among the most extensive and complete of any in the United States. Thirty-one distinct buildings are now occupied in the vast operations carried on, with a total area of 140,000 square feet of flooring space.

As may be seen by the subjoined table, the tide of prosperity touched high water mark in 1873, when 82 engines were turned out; when 780 hands were employed, \$420,000 was disbursed in wages, and the total value of the product, locomotives and machinery, was \$1,569,000. From this point the tide receded, the production falling to 33 locomotives in 1874, 28 in 1875, 39 in 1876, until 1877 was reached; in this year but nine locomotives were built and but little machinery. The number of hands had decreased to 235; the pay roll was but \$100,000 for the twelve months, though many old attaches were retained when there was positively nothing for them to do; the total value of the product was \$277,000. Very slowly the recovery came. In 1878 but three more engines were built, in 1879 there were only seventeen turned out, but in 1880 the production was increased to 65, 730 hands were employed, but 50 less than in the palmy days before the panic; \$300,000 was disbursed in wages, and the value of the total product was \$800,000. The status at the close of 1881 was: hands employed, 755; wages paid during the year, \$380,000; locomotives built, 106, in addition to silk, cotton and other machinery; total value of product, \$1,350,000. The production may be estimated at three-fourths locomotives and one-fourth machinery.

The officers of the company at this date were: President, John Cooke; Vice President and Superintendent of machinery department, Jacob T. Blauvelt; Secretary and Treasurer, William Berdan; Superintendent of locomotive construction, James Cooke; Assistant Superintendent in this department, John S. Cooke.

At the election in April, 1882, the following were chosen: President, James Cooke; General Manager, John S. Cooke; Secretary and Treasurer, William Berdan. Jacob T. Blauvelt, whose resignation as Superintendent of the machinery department, with which he had been connected since 1838, was tendered and accepted, received the thanks of the Board of Directors and many wishes for long life, health and happiness. Thus John S. Cooke, who is still a very young man but who has shown a wonderful ability in the performance of his duties at the works, succeeds to the superintendency of both the locomotive construction and the building of machinery. The Directors are James, Watts and John S. Cooke, W. O. Fayerweather and Robert Barbour. The nominal capital of the company is \$400,000, which is represented by 4,000 shares, of which the Messrs. Cooke (including the late John Cooke's estate) hold 3,250 shares and Robert Barbour 750 shares.

Through the courtesy of Secretary and Treasurer William Berdan the following table has been prepared, showing the locomotive production of each year since the commencement, in 1852:

1853. ....22	1861 .....19	1869 .....53	1877..... 9
1854 .....23	1862.....33	1870 .....76	1878..... 12
1855.....17	1863 .....62	1871.....65	1879..... 17
1856 .....29	1864.....69	1872 .....72	1880 65
1857 .....26	1865..... 66	1873 82	1881.....106
1858 8	1866 .....62	1874.....33	
1859 .....32	1867.....49	1875.....28	
1860 30	1868.....32	1876.....39	

This gives a total of 1,286 engines built in the twenty-nine years, representing, if estimated as in a former chapter, \$19,290,000 in value. To this must, of course, be added the value of the machinery product, which would give a grand total of about \$25,000,000—a princely record.



CHAPTER XXVII.

LOCOMOTIVE-BUILDING.—WILLIAM SWINBURNE'S WORKS.

ALL the locomotive-building establishments thus far described, though they originated many years ago, having each been born of some other form of industry (their several proprietors' firm names, or company organizations having changed, too, from time to time), are still in full operation and are increasing in importance with each passing year. But there was one locomotive shop, which in its time ranked among the first in Paterson, that has been blotted out of existence entirely.

William Swinburne's locomotive works were located at the corner of Market street and the Erie Railway, the present site of the Erie repair shops. They were erected in 1851 by the present Paterson City Comptroller, William Swinburne upon his retirement from the N. J. Locomotive and Machine Company, as already noted. The size of the main building was 200x40 feet, two stories, and there was beside a blacksmith shop 200x25 feet, one story, both of brick. Here Mr. Swinburne, the pioneer locomotive-builder of Paterson, firmly established himself, and here, being remote from the water power used by all the other locomotive works and most other manufacturing establishments, he took the initiative in the use of steam-power for driving heavy machinery. This was the first large concern in Paterson the machinery of which was driven by steam-power. The engine, which was built some time before by Mr. Swinburne, when he was still with his old partners, on the raceway, and which was taken by him when the affairs of the concern were settled, was 25 horse-power. He soon found that he needed a more powerful one and purchased a Burden engine of 40 horse-power. At the new works business was prosperous and orders plenty. From 200 to 300 men were employed. The product was solely locomotives. The capital invested by Mr. Swinburne at first was about \$30,000. The product for the five or six years of its operation averaged about eighteen finished engines each year, or upward of 100 engines in all. For a time the business was all that could be desired, and then the panic of 1857 came and this prosperous industry, sharing the fate of many others of all classes, was swept out of existence. At the time when the storm broke Mr. Swinburne had six engines on the floor, and one had been run out for shipment. He picked up a paper

one fine morning and read of the failure of the Ohio Loan & Trust Company, on which institution the Western railroads were largely dependent, the very closest financial connections existing between the company and the various railroad corporations. For instance, Mr. Swinburne was building five of the engines for the Ohio and Mississippi Railway, and the money, \$50,000, was on deposit with the collapsed company. It was the same with the Marietta Railway, and others. Most Eastern locomotive and machinery builders had the notes and bonds of the Loan & Trust Company in greater or lesser amount. The other Paterson locomotive builders also suffered, the Rogers Works to the extent of about \$30,000. Mr. Swinburne has thousands in the worthless paper yet.

Of course this, and other losses of that time, crippled him, and he discharged his employes, save enough to finish up the engines on hand. Then he set to work to get what he could out of the wreck. Engines shipped before the collapse and not paid for, seeing the bank of deposit had failed, were seized by creditors on the way to their destination. Finally, Mr. Swinburne went West to try and collect what he could of about \$80,000 secured by bond and mortgage on Western farms. He, in some instances, offered to take 80 per cent. on these and cancel them, but the money could not be had, and his success was poor.

While engaged in this hopeless task Mr. Swinburne fell into the hands of a slippery Western lawyer. By Judge Dickerson's advice he sent \$15,000 worth of the best of the securities to a Milwaukee attorney to collect, and this course promised well at first, for remittances came in sums of \$600, \$500, \$300; then they suddenly stopped and nothing more was heard. It was afterward found that the lawyer had collected about \$90,000 for different parties and had then decamped.

Mr. Swinburne was not compelled to close up business, but he was weary of the struggle. At the time he took the last Western orders he could have retired worth \$100,000, and he was in a great state of uncertainty as to whether or not he had better touch the engines, but finally decided to chance it. The Danforth and the Rogers Works each had ten engines to build for the same company.

Among the crippled railroads was the Chicago, Alton & St. Louis, and Governor Mattison of Illinois was President and held \$300,000 worth of stock. Mr. Swinburne had about \$60,000 against the road and he applied for his money to Governor Mattison, who received him suavely enough, and, as there was a plan of reorganization on foot at the time, referred him to Superintendent Spencer, at Bloomington. Mr. Spencer said he would settle if Mr. Swinburne would throw off \$10,000 and take \$3,000 notes due at intervals of 30 days and payable at the office of Clark, Dodge & Co., New York City. All this was agreed to, gladly. The first note was paid when due, the second was all right, the third was presented and Mr. Swinburne was met with the startling announcement, "no funds." The notes were carried on until at last Mr. Swinburne, wishing to pay claims against his business, bundled up \$30,000 worth and took them to New York. He visited one Hendricks, a copper merchant, whom he owed a bill of about \$3,000 for flues, etc., which was not yet due. Mr. Swinburne offered 150 cents to the dollar in Chicago, Alton and St. Louis paper. "I'd rather have the account stand" said the merchant decidedly. "Aye," returned the debtor, "but I don't know where I'll be when the bill is due." Finally,

the man accepted the paper. Another bill of about \$4,000 was paid with \$6,000 in the same paper, endorsed by Spencer. Mr. Swinburne succeeded in paying all out at 150 to 200 cents to the dollar. Afterward he sold his buildings, the Bank of Jersey City becoming purchaser, and the tools and plant, retiring from business honorably, but with very little to show for the labor of a lifetime. He had been nearly a quarter of a century employed in locomotive-building exclusively, and nearly all was swept away.

The total number of locomotives turned out by Mr. Swinburne was 104, and of these 23 were completed in 1852, 31 in 1853, 22 in 1854, 9 in 1855, 11 in 1856, and 8 in 1857. Then came the end, and one locomotive-building establishment—and the only one that has become extinct since the business was undertaken in Paterson, in 1835—was blotted out.

RECAPITULATION.

The following figures represent the total yearly production of all the locomotive works, including the establishment of William Swinburne (which contributed its quota from 1852 to 1857), from 1837 to 1881, inclusive. From these will be seen, as by noting the rise and fall of the sensitive mercury the temperature is indicated, the various fluctuations in the business of the country; the successive periods of prosperity and depression can be readily marked:

1837	-	-	1	1849	-	-	51	1861	-	-	78	1873	-	-	463
1838	-	-	7	1850	-	-	53	1862	-	-	115	1874	-	-	113
1839	-	-	11	1851	-	-	67	1863	-	-	181	1875	-	-	80
1840	-	-	7	1852	-	-	109	1864	-	-	223	1876	-	-	67
1841	-	-	9	1853	-	-	166	1865	-	-	215	1877	-	-	48
1842	-	-	6	1854	-	-	183	1866	-	-	223	1878	-	-	105
1843	-	-	9	1855	-	-	148	1867	-	-	168	1879	-	-	112
1844	-	-	12	1856	-	-	176	1868	-	-	156	1880	-	-	247
1845	-	-	14	1857	-	-	151	1869	-	-	276	1881	-	-	457
1846	-	-	17	1858	-	-	48	1870	-	-	322	....	....	....	....
1847	-	-	22	1859	-	-	110	1871	-	-	325	....	....	....	....
1848	-	-	39	1860	-	-	134	1872	-	-	357	....	....	....	....

To assist in a clear understanding of the status of this industry, which, from its peculiar character, is dependent, beyond all others, upon the general prosperity of the country, and is in consequence an excellent barometer, attention is called to the following exhibit of the condition of the business in 1873, 1877, 1880 and 1881 respectively; the former having been the best year ever known in the industry in Paterson before the panic; the second the most depressed, the latter years the latest whose production has been recorded:

Years.	No. of Engines Built.	No. Men employed.	Total amount of Wages.	Total value of Product.
1873.....	403	3,172	\$1,850,077.18	\$6,976,750
1877.....	48	325	165,137.91	707,750
1880.....	247	2,387	976,505.00	2,417,000
1881.....	457	3,042	1,298,000.00	4,362,000

In the above the product of the Danforth Works is regarded as one-fourth machinery and three-fourths locomotive engines, as before noted (this being the estimate by the company's officers), and only the locomotive product enters into the account.

Following will be found interesting figures which show at a glance the total number of engines built in Paterson, at the existing works and at the one now extinct, Mr. Swinburne's; also the total, estimated, value, the estimate being based on figures furnished at the different works showing the prices of engines at different dates; also the total area occupied, capital invested, etc:

Total number of engines built from 1837 to 1881, inclusive.....	5,871
Total value of locomotive product, estimated.....	\$86,405,000
Total number of buildings occupied.....	73
Total area of flooring space occupied, in sq. feet.....	645,000
Total capital invested in locomotive construction, about	\$3,750,000

It is estimated that at the close of 1881 there were 17,720 locomotives in the country, of which New England had 1,700, the Middle States 6,000, the Western 7,800, the Southern 1,800, and the Pacific States 420. Massachusetts has 968, New York 2,000, Pennsylvania 2,700, Illinois 1,900, Georgia 303, Virginia 300, and Florida 38.



CHAPTER XXVIII.

THE SILK INDUSTRY.—ORIGIN AND PROCESSES.

AT this stage, the “arm of iron” having been laid bare and exposed, attention is invited to a consideration of the “sleeve of silk.” Paterson has been most aptly termed “The Lyons of America,” the manipulation of silk having taken root and grown here as it has in no other place on the continent. This is the result of a most happy conjunction of circumstances—and men. Among the potent factors contributing to success are the extremely favorable situation, remarkable water power, the ample and uniform supply of pure water for manufacturing purposes, and the great energy and indomitable enterprise of the men who, fortunately for the modern “Lyons,” have identified themselves with her manufacturing interests from an early period. To these advantages may be added the sobriety, industry and intelligence of the operative class, who seem to understand that the interests of employer and employed are really one and the same, and can never be otherwise, for any length of time; that there are laws which govern all the questions of labor and capital, demand and supply, production and wages, as fixed and unalterable as the laws of the Medes and Persians, and that neither employer nor employed may disregard them without disaster. All this has come to be quite well understood in Paterson, and the most friendly relations subsist, as a rule, between those who furnish the capital and those who do the work. Men of capital will probably never be driven from Paterson, as they have been from other industrial centres, through an utter hopelessness of ever establishing any satisfactory relations with the working class; who, if they did not rise and ruthlessly destroy that by which their bread was earned, were continually in a state of ebullition and chronic discontent that rendered impossible all calculations for the future and unsettled the very foundations whereon capital and labor alike must be fixed if success is to be achieved. There has been just enough of this sort of thing in Paterson to illustrate what such a course would naturally result in.

All the above, and other elements which need not be enumerated, have combined to foster the silk industry in this comparatively new centre and to promote its growth with a rapidity, especially for the past few years, that seems almost too great for belief.

The germ of the whole vast silk fabric is found in the silkworm, and it may be of interest to readers of this work, including the thousands whose deft fingers daily manipulate the delicate web which it spins, to know somewhat as to its origin and operations. It is proposed to merely sketch those earlier stages of silk culture and manipulation, and popularize what has already appeared in too ponderous form for the general reader.

It seems strange that silk, of all filamentary substances that which gives the finest, most durable and most elastic thread, with a tenacity equal to that of good iron (that is to say, a thread of silk of the same size will support nearly the same weight before breaking), should be the product of an unsightly worm; but so it is.

Silk is a liquid, gummy substance secreted by certain insects, from their food, at different stages of their growth; it is contained in cells or tubes on each side of their bodies, and, at their volition, is drawn out through the minute orifices of the organs called spinnerets. From two to six of these threads being united as they are drawn out, they harden and strengthen to form a fine but remarkably strong thread. This thread is used by the insects themselves for a variety of purposes; the spiders, of which one large family are spinners, use their threads as a means of locomotion, and in the formation of a trap for catching their prey, themselves remaining concealed in a little chamber of silk at the centre, or at one angle of their web; and some species also spin a little cocoon or egg-case to protect their eggs from injury.

Of the caterpillars, some, like the tent-pillar, spin extensive and closely-woven nets or tents, from the fibres of the leaves they have devoured, and, drawing these partly round them as a protection, pass into the chrysalis state; others, like the measuring worm, use the threads they have spun almost entirely for the purpose of locomotion; while the larvæ of the *Bombycidae*, or silkworm family, and of some others, do not attempt to spin until they are ready to pass into the chrysalis condition, and then enshroud themselves in a silken cocoon of their own spinning. In all these cases the product is the same, viz.: silk, but silk which requires to be reeled or carded, spun, doubled and re-doubled, cleaned, twisted, and otherwise manipulated before it is fit for use.

There are two hundred or more species of larval and perfect insects that produce silk, but comparatively few are of service to mankind. The spider family, though producing silk of the most exquisite quality, which has repeatedly been used for making articles of silk, must be rejected from the list of practical workers on account of the uncertainty of their tempers, the small amount of their product and the impracticability of maintaining a continuous industry on the part of the insects for sufficient time to draw forth their supply.

Even among the *Bombycidae*, all of which produce silk cocoons, there are not more than twelve to fifteen species whose cocoons are available for commercial purposes; some cannot be reeled, some are dark-colored, some feed on leaves which make the silk inferior, and others will not thrive under culture. The best of all is the genus *Bombyx*, which feed by preference on the leaves of the white mulberry (*Morus alba*) though some may be reared on the other species of mulberry, including the *M. Multicaulis*, about which there was such a furore in this country about a half-century ago.

According to the Chinese work, *Tsun-ling-shu*, there are twelve kinds of silk-worms, as follows :

- | | |
|--|--|
| 1. The worm of three sleeping periods, and whose <i>papilio</i> pairs once a year. | 7. <i>Hoi-cul-tsan</i> , "the ash-colored child." |
| 2. The worm that holds four sleeping periods, and whose <i>papilio</i> pairs twice a year. | 8. <i>Tsui-mu-tsan</i> , bred by an Autumn <i>papilio</i> . |
| 3. The silkworm with the white head. | 9. <i>Tsui-tschong-tsan</i> , which appears in the middle of the Autumn. |
| 4. The so-called <i>Hi-schi-tsan</i> . | 10. <i>Lao-tsiu-cul-tsan</i> , "the old child of Autumn." |
| 5. <i>Tsu-tsan</i> , the silkworm of the province Tsu. | 11. <i>Tsui-wei-cau-hiai-tsan</i> . |
| 6. <i>He-tsan</i> , the black silk worm. | 12. <i>Kin-cul-tsan</i> , "the gold-stuff child." |

The silkworms of China and Japan are mostly of the genus *Bombyx*, but reared in different climates the same germs assume different colors and vary greatly in size. For instance, most Japanese cocoons are of a pale green color; those of China, white or yellow, occasionally tinged with pale green; those of the best silk districts of Turkey are pure white. The Asiatic and European cocoons differ in another respect; some breeds of silkworms go through their changes but once a year and yield very large cocoons; others go through them from two to eight times, yielding numerous small ones.

The changes which the silkworm undergoes are those which are common to all caterpillars or lepidopterous insects. The moth, miller, or perfect insect, which, after a longer or shorter time, according to the genus, the climate and the temperature, works its way out of the cocoon, has but a brief life, not exceeding a week in any case, and usually of only two or three days. In this time, the female moth lays about 400 or 500 eggs, whitish or yellowish, and about the size of a mustard seed. These usually, though not always, adhere by a gum analogous to silk, to the leaves, paper, or other surface on which they are laid.

In the annual varieties they may be kept without hatching, in a cool place, for seven or eight months, and may even make the circuit of the globe. When their food is ready for them they are hatched, and at first the worm does not exceed one-twelfth of an inch in length. Under favorable circumstances of food, warmth, etc. they go through their various changes in from 20 to 56 days, moulting or casting their skin four times. When they have attained their full growth, they are about three inches in length, and have increased in weight from 1-100th of a grain to 80 or 90 grains. At this time they seek a place to spin their cocoons, which are generally finished in from three to six days. In the cocoon they assume the chrysalis condition; and, in a period varying from twenty to forty days, the perfect insects emerge from the cocoon to pursue the same round again.

Now that a cocoon has been achieved, we have to reel the delicate fibre, the most difficult of all operations pertaining to the preparation of silk material, and very important, owing to the fact that the value of the raw silk depends largely upon the way in which the reeling is performed.

There are two distinct kinds of French and Italian silk, the "country silk" reeled in households and by primitive methods, and the "filature silk" reeled by

skilled labor and with great care at the filatures. Very little of the former kind is sent here, as it is difficult to manipulate. It is used mainly in Europe, where labor is cheap. The silk produced in China is at first "country silk," and to prepare it for this market it must be re-reeled. The Japanese have filatures, and prepare their silk in the very best manner. In Asia, as in Europe, the poorest qualities are kept at home and the best shipped; America gets the finest and best silk produced, using it as a measure of economy.

The implements used to convert the cocoons into silk are most simple in all countries of the world. They consist principally of a basin and a reel. The basin is used to receive the cocoons, and contains warm water to soften the gum of the silken envelope, so as to set free the threads forming the external fibrous layers. A union of a number of these threads, achieved in the reeling, forms the thread of commerce—the "raw silk." The reel, by its rotary motion, winds off the cocoons. In the factories a number of these winding machines are placed side by side, and run with a single uniform motive power, the operator stopping one at will while the others continue to work. The operation is entirely automatic at the factories, except that at each reel are a basin and a woman, the latter to superintend the work. During the process the cocoons are frequently immersed in warm water, the first layers are cleansed with a brush until the clean threads are reached, and a certain number of threads are always united by pressure or twisting, according to the standard of raw to be produced.

There are about one dozen distinct processes which raw silk must undergo to prepare it for the loom. The business of putting raw silk into threads, such as are required for the different kinds of weaving, is called "throwing." The threads thus formed are known in commerce as "singles," "tram" and "organzine." There are also a few other specialties in thrown silk, but the above are the chief forms.

A brief note of each step toward the loom will give a clear understanding of the various stages: The singles are the raw silk after the first twist; the tram, or woof, is obtained by the union of two or more threads of raw silk slightly twisted; the organzine, from which generally the warp is made, is the result of two singles twisted together; a product of a peculiar nature, frequently used in the manufacture of trimmings, is the *fil guipe*. It is composed of one or more straight threads, around which is rolled a spiral thread, the interior being generally of indifferent material, and the thread rolled around is composed of silk, gold or silver. The dyeing constitutes an important specialty, requiring the greatest possible delicacy and skill, pure water being essential to success. The preparation of the threads for the loom is another separate and essential branch, requiring care and attention. The weaving embraces in itself alone several sub-divisions, namely: The weaving of plain and cut silk goods, the weaving of velvets, of figured stuffs more or less rich, the knitting of various articles, and fabrication of silk blondes or laces.

To illustrate more clearly the tedious processes of preparing the raw silk for the loom, each distinct process is now placed in its proper order, as follows :

<i>For Organzine.</i>	<i>For Tram.</i>	<i>For both Organzine and Tram.</i>
Assorting.	Assorting.	
Winding.	Winding.	
Cleaning.	Cleaning.	
Spinning.	Doubling.	
Doubling.	Spinning.	
Twisting.	Dramming.	
Dramming.	.....
.....	
Winding.	Winding.	Dyeing.
Cleaning.	Cleaning.	
.....	Doubling.	
Warping.	Quilling.	
Picking.	.....
.....	.....	Weaving.

In each of these processes, except dyeing, imperfections in the thread cause loss of time, money and material. The loss of time, when machinery, running at high speed, has to be stopped, becomes a serious matter, from the mere fact that there is no production during the stoppage. "It costs," said a Paterson manufacturer, "fully five times as much to tie a knot in this country as in France." This is owing to the difference in the wages paid.

At various stages of its progress from the cocoon to the loom, the silk is subjected to a series of sortings. American manufacturers are very particular in this process, in respect to sizes, and the superiority of domestic silk products is traceable to this care. Previous to the first winding there is a careful sorting. Afterward, at a later stage, the threads are weighed—before dyeing—by a mechanical process termed "dramming," which is a very accurate method. Then they are sorted again.

"Picking" consists in spreading out every thread of the warp separately, examining it with the greatest minuteness, and removing all knots, slugs and irregularities of whatever sort. It is singular to watch this process at one of the great mills. A large number of slowly-moving threads are spread out like a huge fan, while keen eyes are bent upon them, and nimble fingers seize and extract the imperfections. In the very best silk scarce a lump or an irregularity can be seen by the untrained eye, but on an inferior quality they will be numerous and comparatively large.

There is another and totally different method of treating the product of the silkworm, which may be described briefly. If, for any reason, the filament of the cocoon cannot be reeled it must be spun. The raw material unfit for reeling bears the general name of "waste." This has created a wrong impression, many regarding the foundation for spun silk as a kind of shoddy. This is very erroneous. Shoddy is obtained by tearing into fibres goods previously manufactured—a process not often applicable to silk. After silk has once been twisted into a thread it cannot readily be torn asunder to any good purpose. Actual fibre is required in spun as in reeled silk. Even if a low grade of waste is used, only the fibre can be utilized; the rest is loss. Waste silk is of various kinds, perforated cocoons—pierced by moths—furnishing the greatest supply. Besides these there are irregular cocoons, from which the silk cannot be wound; filature waste, consisting of tangled threads

or floss on the outside of cocoons and the waste made in winding; also mill waste, which is raw silk more or less broken or tangled in the earlier operations of the silk mill.

The only difference between waste and ordinary raw silk is want of continuity of fibre. It has to be straightened, ungummed, carded and spun by methods similar to those used with flax and cotton; when this is done it is of about the same value as reeled silk in the gum. The processes of manufacture of spun silk are as delicate and trustworthy as those of cotton spinning. The material passes through a series of different machines, some of them marvels of ingenuity, and when ready for spinning looks like the whitest of combed fleeces, and with a lustre as of combed glass. It is then so perfectly uniform that the standard of the thread required can be produced with absolute mathematical accuracy—that is, of any required size. The spun is often used in conjunction with the reeled silk, the best effects being produced by using the lustrous reeled silk for the surface of the fabric and the spun silk for the body; to achieve a dead surface with a lustrous figure this method is reversed.

The unusual care and attention brought to bear in working up waste have been caused by a very great appreciation of this material in later years. Formerly, certain sweepings or threads were thrown in the real “waste” heap, there being no attempt to unravel or utilize them, but of late years for the disintegration of these, the most ingenious and effective machines have been devised. These take even “chiffons,” or rags, at their entrance, and restore them at their exit carefully classified in filaments of equal lengths and fineness. The inventors have never exhibited these machines for fear of imitations by countries where inventions are not protected by patents. Establishments for the utilization of this class of waste are very rare; it is said that there is but one in England, one in France, and one in this country—where, it is impossible to learn. Of the mills where ordinary waste is manipulated, there are a number in the country, two of them being in Paterson.

Almost every variety of fabric that is made of reeled silk has its counterpart in articles composed wholly or in part of spun silk. It is claimed for these latter fabrics that they fill a place of their own in the market. They supply a cheap and serviceable material. The purchaser at least gets silk that is pure—not loaded with dye-stuffs. There are only two ways of making cheap silk fabrics, one being to weigh them with dye-stuffs; the other, to use spun in lieu of reeled silk. The former have no wear in them; the latter do good service. Spun silk *can* be weighted the same as the reeled, but it is not often done, except for fringes, when it is weighted to fifty or sixty ounces. The comparative want of lustre of the spun silk fabrics is much less than formerly, owing to the great improvement in its management.

Silk goods, with very few exceptions, are not dyed in the piece, but in the yarn; hence we have still to glance at this process before we can consider that we are ready to bring our threads, of reeled and thrown, and of spun silk, to the loom prepared to produce any of the beautiful fabrics that have made this department of “Industrial Paterson” famous the world over.

A great variety of colors is now a chief feature in dyeing silk. The range of tints was formerly very narrow, even up to within a few years; now that dyeing

comes within the domain of science, the purity, brilliance, delicacy and variety of colors are almost incredible. As to the permanence of the many new hues, not so much can be said. Foulards and imported, also domestic, articles of unsaleable colors are, at times, dyed in the piece. To "ecrus," or unbleached silks, the colors are often applied by stamps. The infinite variety of hues that have multiplied, especially in the past few years, is largely due to the endless discoveries in aniline dyes, which may be used to produce every tint, shade and color desired, except black. Aniline black has not as yet proven a success. The combinations of colors achieved are wonderful. Recently there were ribbons in vogue which required the use of five or six shuttles, each carrying a different color. At the Centennial, in 1876, a dyer exhibited the solar spectrum in colored silks with fine effect, using about 100 shades. Every year the dyers are learning more and more as to how to make aniline colors "fast," for some of the more delicate shades are naturally fugitive. The chemical dyes imported are said to be the best of their kind, much superior to what are used in Europe. As to "weighting" with excess of material, let us not suppose our dyers are ignorant of the art. If manufacturers want loaded silks they can have them—to order. In most instances, however, the dyers may safely repeat, in reference to overweighting in their processes, the famous comment of Mark Twain upon the legend asserting that Washington couldn't tell a lie: "*I can, but—I won't.*"

Whether the weaving is to be done by hand or by power-loom one of the first preparations is making the warp. If the warp is intended for a dress piece to contain 5,000 threads, 200 spools are arranged on steel wires or pins—on which they are to revolve as the threads are drawn off—all of which are placed at appropriate distances in an upright frame called a creel. Opposite this, about two or three feet distant, stands the mill, a wooden frame cylinder about seven feet high, and from five to ten yards in circumference. This revolves on pivots and is turned by a crank at the convenience of the warper. The ends from each spool are passed through 200 eyelets forming a part of a piece of mechanism called a jack, which divides the threads and guides them on the cylinder or mill where it revolves. The jack is affixed to an upright beam situated between the mill and the creel, traversing from top to bottom and from bottom to top, the jack being drawn up by a cord attached to the upper pivot and let down by the unwinding of the cord. For a five thousand-thread warp and two hundred threads or spools to the creel it is evident that twenty-five upward and downward motions of the jack are necessary before the bulk of the warp has received its full quota of threads. When finished the warp is drawn from the mill and carefully balled on the hand. The ball is then taken to the picking frame and drawn on a roll and out in sections by a comb-like instrument called a "heck." The warp is then drawn on the loom-roll after first having been put through a reed which is drawn through the warp with rods while being finally picked and wound on the second or loom roll and threaded through the heddle, the number of the heddles varying according to the fabric to be woven. This is the plan generally in use for organzine warps, though some manufacturers have adopted new and labor-saving machinery for the purpose. The above is the process whether the weaving is to be performed by hand or power-loom, and

whether the product is to be plain, twilled or figured—by means of the Jacquard.

It is unnecessary to go into a minute description of the various looms in use for silk weaving. The old hand-loom, which may be heard making its peculiar clatter in so many Paterson homes, is one the oldest, simplest and most widely used pieces of machinery in the world. It was known in almost its present form to the Egyptians and Persians, and in India and China, in which latter country it was used more than 4,000 years ago. There is even a statement to the effect that it antedates the Flood. The upright posts, the different sets of treadles or harness depending from the cross-beams above through the loops or eyes of which the threads of the warp are passed; the roller moved by a crank, around which the warp is wound, and a second roller to receive the woven goods; the shuttle, which with its bobbin carries the thread of the weft or filling; the swinging bar, the reed which brings each thread home—"beats it up"—and the treadle which depresses alternately the sets of harness—who has not witnessed the operation of this simple machinery? It is understood, too, by most that the figure woven depends upon the number of treadles and the arrangement of the warp, and that for particular figures there is needed a special harness and a variety of shuttles. In the invention of the power-loom the questions to be solved were to make the processes of the old hand-loom automatic, exact and rapid; to obtain tenseness in the warp; to effect its gradual unrolling and the rolling up of the woven goods; to drive the shuttle back and forth at the proper time; to beat up the tissue properly; to effect the stopping of the machinery for the substitution of a new filled bobbin when needed; and, above all, to accomplish ten or more times the work of the weaver by hand within a given period. All this has been achieved—abundantly. The many improvements recently made permit the weaving of satins and velvets and of most goods of regular figure on the power-loom. The many attempts to substitute some other method of carrying the weft or filling the shuttle have generally proven failures, but a comparatively recent invention known as the Earnshaw Needle Loom, improved by J. H. Greenleaf, performs very well what is required. By an ingenious stop motion invented by the latter the loom stops instantly on the breaking of a single thread. These looms are calculated for much greater speed than the ordinary power-loom.

What is usually known as the "Jacquard loom" is not really a loom but an attachment to one, and can be adapted to any. Joseph Marie Jacquard was a Lyonnaise, a weaver, and exceedingly poor. After the French Revolution inventive talent was fostered, and he, employed by a Lyons manufacturer, improved the then existing machinery with a view to substitute mechanical device for the labor of draw boys in making figured goods, the boys being required to maintain a position so unnatural and constrained that in a few years their health was ruined. The invention was not perfected before about the year 1800, after ten years of labor. Jacquard made no attempt to obtain the reward offered by the London Society of Arts for such an invention, and after showing it to a friend put it aside, and for some time it was forgotten by him. To his surprise, he was one day sent for by the Prefect of the Department, who inquired about the machine and requested him to make another, the original having been lost or destroyed. This he did, and a

few weeks later he was summoned to Paris and introduced to Bonaparte. "Are you the man," asked Carnot, the minister, "who pretends to do what God Almighty cannot do—tie a knot in a stretched string?" Jacquard answered that he could do, not what God could not do, but what God had taught him to do. He explained his device to the Emperor, who rewarded him with a pension of a thousand crowns, gave him employment in the Conservatoire des Arts, and, while thus enabling him to exercise his ingenuity in other ways, encouraged the adoption of the excellent Jacquard loom. That, however, was almost more than imperial patronage could effect. The Council des Prud'hommes, who are appointed to watch over the interests of the Lyonnaise trade, broke up his machine in the public place. "The iron (to use his own expression) was sold for iron, the wood for wood," and he, the inventor, was delivered over to universal ignominy. Afterward the Lyonnaise were glad to adopt the Jacquard, and two years later the Government bought his invention.

Anything like an adequate and intelligible description of the Jacquard attachment is a hopeless task. The most prominent features are: first, a box containing 100 or more wires or needles pointing outward; and second, a hollow, prism-shaped revolving cylinder around and on which passes a chain of cards attached to each other like a "Jacob's ladder." If the pattern be complicated the number of cards is greater. The revolving cylinder presents a new card to the points of the wires at every quarter of a revolution, the holes in the cards being so arranged as to raise in succession those threads which will make out the intended pattern, and it is necessary that there be as many cards as there are threads of weft in the pattern. A portrait of Jacquard woven in silk by Lyonnaise weavers, representing him in his workshop with his implements about him, planning his great invention, required 24,000 cards, each large enough to receive 1,000 holes. The Washington portrait bookmark made during the Centennial year by the Phoenix Manufacturing Company, of Paterson, required about 10,000 cards.



CHAPTER XXIX.

THE SILK INDUSTRY.—OUTLINE HISTORY.

IF Chinese records are to be depended upon, that country, noted in the present day for its production of silk, appears to have been its cradle, in a very remote epoch. According to the Chinese account, silk in point of age stands about midway among the textile fabrics; wool and flax having preceded it, while cotton, hemp and other fibrous plants followed it somewhat closely. The exact date when its use was discovered is somewhat uncertain, it being variously placed at 2,650 to 2,700 years before Christ. From this the deduction is that *Houng-ti*, Third Emperor of China, contemporary of Joseph, the son of Jacob, must have been the first silk culturist.

It is, therefore, an industry of royal birth, and here is a legend that all silk operatives in Paterson and elsewhere of the present day will be interested to hear, as it stamps their labor with the ennobling seal of royalty. The tradition, as found in the Chinese work *Hou-ti-nan wang*, is that this Chinese Emperor, desirous that *Si-ling-chi*, his legitimate wife, should contribute to the happiness of his people, charged her with the cultivation of the silkworm and the testing of the practicality of utilizing its product. In this the royal silk operative was eminently successful, not only raising large numbers of the worms but learning to reel the silk and make it into garments. The Empress has accordingly been deified under the title of "The Goddess of Silkworms," and to this day the Chinese celebrate every year the *con-con* feast in her honor.

Silk production extended at a very early day to the adjacent nations, though the secret was most jealously guarded by the Chinese. Still it was a long time in reaching Europe, some holding that it was not known there until the fourth century before Christ. Others think that through the maritime trade or the overland traffic by caravan for nearly a thousand years B. C., the raw silk must have been carried into some of the cities of the Grecian Archipelego, where it was manufactured into robes for kings and princes. Of this early period the statement is that the raw silk garments and was sold at such a fabulous sum that the fabric cost ounce for ounce its weight in gold. For a long time after the first discovery of its uses the Chinese forbade the exportation of raw silk or silk worms' eggs under penalty of death.

Nothing, however, could prevent the Westward march of His Wormship. All silken fabrics were in great demand in profligate Rome, even at their then tre-

mendous cost, but the Emperor Tiberius prohibited their being worn by men, declaring it a mark of effeminacy, and the satirists of that day inveighed against the wearing of the transparent silken tissues then produced, on the ground of indecency. In A. D. 222 the debauchee Heliogabalus scandalized his people by appearing in a garment made wholly of silk. In A. D. 273 the Emperor Aurelius refused to procure his Empress a silken robe because of the extravagant price and the bad example. Doubtless she pouted or sulked over the refusal as several millions of her sisters have since done when denied a coveted silk.

In the year A. D. 552 two Persian monks who had lived in China as missionaries, and had learned of the silkworm, succeeded in conveying a large number of eggs, concealed in hollow canes or "palmers," staves, to Constantinople at the peril of their lives. These were hatched and formed the nucleus of the industry there, the monks revealing all that they had surreptitiously learned while in China of the care of the worm and the manipulation of the product.

Coming down to a later period we find that in A. D. 877 the rebel chief Baichu captured Canfu, the chief centre of the Chinese silk industry, put to death all its inhabitants, among them 120,000 silk merchants, destroyed its mulberry trees and silkworms and left the industry to grow in Western Asia and Eastern Europe, where it had become firmly established. The silkworm made slow progress, however, in Europe. In the year 910 he made his appearance in Cordova, Spain, brought there by the Moors, and in the 10th and 11th centuries the silk manufactures of Spain and Sicily were extensive. King Roger, first Norman king of Sicily, invaded Greece in 1146 and carried off the silk treasures of Athens, Thebes and Corinth, and took captive a large number of silk weavers and with his booty established more firmly the industry in his kingdom. From Greece and Italy the industry passed to Marseilles, and in the 14th century it was introduced into Avignon. Under Henry IV. Sully established a silkworm nursery in the garden of the Tuileries. Louis XIV. also encouraged the industry in his time. During this time the weaving of silk fabrics with foreign threads had developed greatly. There were beginnings of the manufacture at Tours, and perhaps at Lyons, as early as the 13th century. It is said that the first white mulberry tree planted in France was brought by St. Aubon, a valiant knight, on his return from the Second Crusade. The silk industry was never so developed as during the reign of Louis XIV., in whose time, it is stated, nearly 400,000 Huguenots were engaged in it. When the "Grand Monarch" turned fanatic and revoked the Edict of Nantes, these were all exiled and the industry was nearly annihilated, the 18,000 looms of Lyons being reduced to 4,000, and the 11,000 of Tours to 1,200. The mills were reduced in number from 800 to 70. Of these Huguenot refugees over 100,000 went to England and established the silk manufacture there on a firm basis. This was the first recorded appearance of His Wormship in England. The refugees also carried the industry to Germany and Switzerland, and all these countries soon became formidable rivals of France in this branch, which languished there up to the close of the last century, it having just begun to recover when it was again destroyed by the Revolution of 1793. All attempts at silk culture (the production of cocoons), in England had failed, the climate being unfavorable to the silkworm, until after the

introduction of the Italian method of throwing or twisting, in 1718, through the daring enterprise of John Lombe, a mere youth. Prior to this very little had actually been accomplished. In the time of the magnificent Henry VIII., he could scarcely obtain a pair of silk stockings for gala occasions. His daughter Elizabeth was presented with a pair of English-knit black silk stockings as a remarkable gift.

In 1585 some silk manufacturers had come to England from Antwerp, which gave the business a slight impetus. James I. encouraged the industry, and some throwsters, dyers and weavers were brought from the Continent, and in 1629 the "Silk Throwsters" of London were incorporated, the trade having its dye called "London Black." In 1661 this organization employed 40,000 men, women and children. It was in 1685 that the Huguenot exiles from France arrived and established such seats of manufacture as Spitalfields, producing silk fabrics of the best styles then known anywhere. In 1713, in a petition of the Weavers' Company to Parliament against a commercial treaty with France, it was stated that the manufacture was twenty times as great as in 1664. One great difficulty, however, the English silk manufacturers had always to contend with; they were compelled to purchase their thread abroad—the "Society of Silk Throwsters" being really a misnomer. All the material was formed into threads and twists abroad. In 1702 a Mr. Crotchet had attempted to start a silk throwing mill, but had failed, and it remained for John Lombe, whose name is still remembered with veneration—inasmuch as he not only introduced this important feature into the country, but lost his life by so doing—to succeed in that in which so many had failed. He resolved to visit Italy and learn the processes of silk-throwing at whatever cost, and this he did, starting in 1715. He found great difficulty, however, for the Italians guarded their secret most jealously. At Piedmont, finding the silk machinery closely watched, he gained admission through the connivance of the work-people in the disguise of a common workman, making several secret visits and carefully noting down everything, even to making sketches of parts of the machinery. He was discovered before he was nearly ready to go home, and was obliged to fly for his life, carrying with him his notes and sketches. He would have been assassinated had he tarried another hour. He took refuge on board a ship and escaped to England with his priceless acquisition, accompanied by two Italian workmen whom he had bribed and who risked their lives in following him. Arriving in England he leased an island in the river Derwent at \$8 per annum and built a mill at a cost of £30,000, still standing and known as "The Old Silk Mill." While the mill was being erected the business of silk-throwing was successfully inaugurated, and in 1718 Lombe received a patent for fourteen years. It was found that the thread could be produced vastly cheaper at home than imported from abroad, and as this enabled English manufacturers to compete with the French and others this was really the most important epoch in the history of the silk industry in England. John Lombe did not live long to enjoy his prosperity, for soon after his mill was fairly in operation he died, at the early age of twenty-nine, from poison administered by the two Italian workmen from whom, to a large degree, he had learned the art. The story of Lombe's fate is very curious but well authenticated. It is to the effect that the

Italians in their own country, finding that they had been outwitted and that their lucrative trade was endangered, sent over a female poisoner to take his life if possible. This woman entered the mill as a workwoman, endeavored to gain over her countrymen and succeeded, a slow poison being administered to Lombe that finally resulted in the death of their victim. The Italians then fled to their own country. Grand funerals were then in fashion, and the most superb known in that day was the funeral of John Lombe, who fell a victim to his ambition to introduce a new branch of manufacture for which thousands upon thousands have since had cause to bless his memory. The new mill passed into the hands of Lombe's brother William, who, falling insane, soon shot himself, when it passed to his cousin, Sir Thomas Lombe. The patent expired in 1732, and a petition for its renewal set forth that there had been no emolument. Hutton says that the petitioner forgot he had accumulated £120,000. The patent was not renewed, and soon the silk throwing business was followed in many parts of England. A picture of this first mill represents an immense establishment, four stories in height, one-eighth of a mile in length, and the grand machine is said to have been constructed with 23,586 wheels and 96,746 movements, which worked 73,726 yards of organzine with every revolution of the water wheel, and as it revolved three times per minute, the almost inconceivable quantity of 318,504,960 yards of organzine was turned out daily. Hutton, however, who worked for seven years in this mill, reduces the number of wheels to 13,384. In 1860 there were 400 silk throwing mills in England, employing about 100,000 hands. Owing to various causes, which need not be enumerated here, it was only by the most rigid protective measures that the silk manufactories of England were sustained, even with all the great improvements in machinery and the vast amount of capital invested; and when, in 1860, the commercial treaty of that year admitted French silks duty free many branches of the silk manufacture of Great Britain received their death blow, reducing the silk weavers of Manchester and Macclesfield to beggary by thousands. These two great centres of the silk industry formerly competed with Lyons for the American trade, but at this time the competition ceased. Twenty years ago silk goods of all kinds imported to this country were drawn about equally from England and France; to-day, with very slight exception, we buy no silks from Great Britain.

The duties on silk fabrics abrogated by the Cobden treaty were not heavy, not more than half what ours are at present; yet they had been sufficient to prevent ruinous competition. As an effect of their abrogation thousands of the spindles of the great mills referred to, purchased at a merely nominal price, were brought over and set to running in Paterson and other American mills. The business has, in fact, been largely transferred to this country, whither the reader is invited to follow it

Silk culture was first attempted on this Continent in 1608, in the Colony of Virginia, under the peremptory mandate of the pedantic James I., who hated tobacco, the great Virginia staple, and was silkworm and silk cocoon mad. At first the enterprise flourished, but it went out with the Stuarts, the Protector being too busy with other matters. In 1657 the Colonial Assembly offered 10,000 pounds of tobacco to any planter who would export £200 worth of silk cocoons in a year,

5,000 pounds of tobacco to the producer of 1,000 pounds of raw silk and 4,000 pounds of tobacco to any who would devote himself exclusively to the silk culture. Some silk was produced and sent to England about this time, and there is a tradition that Charles I. or Charles II. had a robe made from it. But the effort was soon abandoned. For the next hundred years there was an occasional appearance of some beau with a silk waistcoat or handkerchief, of home make throughout, and now and then a grand lady would appear at a Colonial assembly in a silk gown made from native-grown silk. The beaux and belles of the present century would look in scorn at the most perfect of these, but in that day they were regarded as the acme of splendor in costume. In 1732 the Colonial government of Georgia did much to promote the growth of the white mulberry and the cultivation of the silkworm, and in 1735 eight pounds of raw silk were sent from Savannah to England and woven into a robe for the then Queen Caroline.

In 1761 the London Society for the Encouragement of Arts, etc., offered a premium of threepence per pound for good cocoons, nearly equivalent to three shillings per pound for raw silk. The cocoons were all brought to a filature established at Savannah for the reeling, doubling, cleaning and twisting of raw silk, and the business came to be quite important. In 1750 the export of raw silk to England amounted to 10,000 pounds. In 1758 a fire at the filature consumed a considerable portion of the works and much silk, and from that date to 1772 the product gradually decreased, cotton culture being introduced in its stead. But one lot of silk is recorded as having been exported from Savannah after the Revolution. In South Carolina also there was a small silk production about the same time as that of Georgia, the quality being highly praised, as equal to the best Italian. The mother of the South Carolina Pinckneys carried some silk produced on her plantation to England about 1768 and had it woven into tissues. Gowns were made of it and presented to the mother of George III. and to the elegant Earl Chesterfield. But King Cotton pushed silk out of the way in South Carolina, as he had already done in Georgia.

Silk husbandry received attention in New Jersey and in Pennsylvania at an early date. Dr. Franklin when in Europe in 1770 sent home seeds, mulberry cuttings, silkworms, eggs, etc., and in 1771 a considerable factory was set up in Philadelphia, which for some years received a large amount of cocoons. From Lancaster County cocoons fifty yards of silk were made and a court dress prepared therefrom for the Queen, who sent a rich gift to the fair donor, for the silk culturist was a lady. About this time large mulberry groves flourished at Princeton and elsewhere in New Jersey, but during the convulsive throes of the Revolution, which soon came, all thought of this business was forgotten.

In the East, Massachusetts and Connecticut took the lead in this enterprise, and as early as 1747 Governor Low appeared in a silk coat and stockings of home production. A few years later President Stiles, of Yale College, officiated at Commencement in flowing robes of Connecticut silk. In 1770 Boston and New Haven vied with each other in raising cocoons, in spinning, dyeing and manufacturing raw silk.

A flourishing sewing silk factory was in operation at Mansfield, Conn., before

the Revolution. Ipswich, Mass., was about as far advanced in the silk manufacture. The largest and finest grove of mulberry trees in the country was growing at Northampton. But the Revolution put a stop to all this, and at the commencement of the present century scarce a vestige of the silk husbandry and manufacture remained. Among the first to recover and pursue the business after the Revolution was the State of Connecticut. Small groves of white mulberry trees and rude cocooneries built of rough boards and shingled might be met with anywhere throughout the State from 1800 to 1825. The cocoons were excellent but the reeling very poor, the threads being uneven and gummy, and, though really better than the imported silk, very inferior in appearance. The manufacture was continued in Mansfield and Tolland County, Conn., until about 1844, and it was not unprofitable. The value of the product at Mansfield was estimated at about \$50,000 per annum from 1820 to 1830. After this the silk husbandry gradually decreased. The difficulty was almost altogether in the manipulation of the cocoons, and it is said that it was proven impossible to educate American women, accustomed from childhood to the careless ways of reeling practiced for seventy years, to the patient, slow, skillful methods of the Chinese, Italian and French women, who think they do well if they produce a pound or a pound and a half of the reeled silk in a week. At no time did the silk culture make any great progress in New England except in Connecticut.

In 1810 the total of the silk product in New London, Windham and Tolland Counties, Conn., was estimated at about \$45,000. During the war of 1812-15, Samuel Chidsey, of Cayuga County, N. Y., sold sewing silk of his own manufacture to a considerable amount. Silk culture was commenced in Ohio, Tennessee, and in other States at the same time, but up to 1824 but little silk was produced in any part of the country; it had become merely a domestic manufacture.

From 1825 to 1844 everybody seemed to have started out on a voyage of discovery, to find ways and means of promoting a revival of the silk culture and manufacture. Duponceau, friend and fellow countryman of Lafayette, D'Homergue, Governors Lincoln and Wolcott, J. H. Cobb, the brothers Cheney and others were among the most prominent. One and another of these experimenters fell into one way of thinking, and finally with accord began to advocate one thing, and that was the raising of a species of mulberry here—the *morus multicaulis*.

The *morus multicaulis* madness was one of the most wonderful that ever possessed the people of this country, as many will remember even to this day. Not only "silk men," properly so called, but grave doctors of divinity, law and medicine, agriculturists, mechanics, merchants—men and women, were infected with an insane desire to rear mulberry trees. The future to these people was a veritable mirage; everybody was to become rich, every woman in the land was to have a dozen silk dresses at least.

Gideon B. Smith, of Baltimore, is said to have owned the first *multicaulis* tree in the United States, in 1826, and Dr. Felix Pascalis, of New York, promulgated the wonderful gospel of *morus multicaulis* and opened the Pandora's box to numberless victims. The excitement grew, and increased until about 1839, when it culminated in the ruin of thousands. Everybody had been carried off their feet. Samuel

Whitmarsh and Dr. Stebbins paid \$25 for a dozen cuttings two feet long and as thick as a pipe stem, in the Spring of 1839, at Northampton, Mass. Soon after they would not be taken as a gift. After the bursting of this bubble attention was attracted to other varieties of the mulberry, more hardy in character, and in August, 1842, according to the record, there was a sale of two trees of one season's growth at North Windham, Conn., one for \$106, the other for \$100, when the balance of the lot were withdrawn because the bidding was not spirited enough!

Since 1844 no efforts of any magnitude have been made to rear silkworms on a large scale; it has been regarded in this country as one of the lost arts. From 1860 to the present time some effort has been made in the Southern States; also in other States, but without much success, though there are those who believe in a future for the silk culture in America. At New Orleans, from 1871 to 1874, an Italian named Roen raised silkworms and shipped eggs and cocoons to Italy, where they were regarded as of very superior quality. But the climate there is said to be too damp. Something has been done at raising worms and manufacturing at San Jose, Nevada City, and San Francisco; also at Silkville, Kansas, and at several localities in Pennsylvania. There have also been abortive attempts in this direction in Paterson and vicinity, and in various parts of New York State. The most important effort of all is now being made by the Women's Silk Culture Association, of Philadelphia.

Aside from special cases of weaving or manufacturing of silk goods as samples of American products, there was probably no other than domestic manufacture of silk, says Brockett in his "Silk Industry in America," until 1810, when Rodney and Horatio Hanks, the latter the inventor of the double wheel-head, erected at Mansfield, Conn., the first silk mill on this Continent, in size 12x12 feet. The product was sewings and twist. In 1814 they associated with them Harrison Holland and John Gilbert and built a larger mill, at Gurleyville, Conn., but this was a failure. In 1821 Rodney Hanks built another sewing silk mill at Mansfield, and this was abandoned as a failure, in consequence of the imperfections of the machinery, in 1828.

William H. Horstmann came to this country from Cassel, Germany, in 1815 and began the manufacture of silk trimmings, braids, fringes, naval sashes, ribbons, etc., at Philadelphia. He had learned the art in France and was an inventor of much silk machinery. He was the first to introduce the Jacquard attachment, in 1824. In 1837-8 his son, William J., designed and manufactured power-looms and introduced their use for narrow goods.

In 1827-8 the Mansfield, Conn., Silk Company was formed, its first successful throwing machinery being made by one of the company, Alfred Lilly, from rude drawings by Edward Golding, a young English throwster. It was not until some time afterward that a successful reel was constructed. This company were large purchasers of cocoons. Finally, through dabbling in the silk culture as well as manufacture, the concern languished, and the company expired in 1839. Nevertheless, this company is credited with having built the first really successful mill in this country. They attempted silk-weaving but were unsuccessful.

About 1829-30 two Frenchmen exhibited an improved reel at North Mansfield,

but Nathan Rixford, of that place, produced a better one. Gideon B. Smith, of Baltimore, and J. H. Cobb, of Dedham, Mass., also made great improvements in reeling.

About 1832 Samuel Whitmarsh placed some silk machinery in what was called the "Old Oil Mill" near Northampton, Mass., built an hundred years ago, and with a capital of \$25,000 went into the silk culture and manufacture. He induced others to join, and the "New York and Northampton Silk Company" was formed in 1834. The mill was enlarged and broad plantations stocked with mulberry trees. Specimens of watch ribbons, satin vestings, &c., were made, but these specimens were mainly to promote the sale of the *multicaulis* cuttings. Whitmarsh became President of the company in 1835, went to Europe in the following year to gain information concerning silk culture, and in 1839 published a book entitled "Eight Years' Experience and Observation in the Culture of the Mulberry Tree and Care of the Silk Worm," etc.

Early in the Spring of 1839 John Ryle, of whom there will be occasion to say much hereafter in connection with the establishment of the silk industry in Paterson, came over from Macclesfield, landed in New York, and, learning there of the silk mill at Northampton, proceeded directly thither. In a week after his arrival he was installed as a weaver at the silk mill. This was in April, 1839. Mr. Ryle was an experienced silk manufacturer, and was soon placed in charge. He found at the mill two looms in operation in charge of two Londoners, from Spitalfield. Mr. Ryle was employed at the mill throughout the season, and during the Summer Mr. Whitmarsh said to him, "I shall make \$250,000 before next Winter." Before the Winter was past Mr. Whitmarsh had neither cash nor credit enough to buy a barrel of flour. The company failed, mainly through coquetting with *multicaulis*, having sunk \$100,000. When John Ryle first came to this country he had never seen a silkworm, and he was anxious to see one. A very few months later there were many people in the country who wished they had never seen a silkworm and desired never to see one again.

Among the very first silk manufacturing establishments in the country was that on Nantucket Island. One Aaron Mitchell, who was wealthy, procured machinery from Dedham, Mass., and the culture of the silkworm having been engaged in quite extensively a considerable industry sprang up at Nantucket, and the Atlantic Silk Company was formed under the management of one Crane. The women and children of that island were left at home alone a greater portion of the time, the men being engaged in whaling, and the culture of silkworms and the manufacture of the product was regarded as a most suitable occupation for them. Mr. Mitchell was enterprising, and his own and others' ships stopped on their return voyages at China and Calcutta, and brought raw silk to manufacture. The product was mainly sewings.

Mr. Ryle while at Northampton learned of this isolated colony of silk workers, and wrote to Mr. Mitchell telling him he thought he could be of much use in his undertaking. The answer was prompt, urging him to come. He went in September, 1839, but did not like the appearance of things, and feared that the business would never be a success. The product cost too much, the processes were crude,

there was too much to unlearn. There was a great deal of experimenting about it. There were from twenty to thirty hands employed. Mr. Mitchell offered Mr. Ryle a very excellent position, but the latter, having no faith in the final results, returned to Northampton, to his former employers, with whom he stayed some time longer before the final collapse.

The fears of Mr. Ryle were realized, for a few months afterward the business at Nantucket was abandoned by Mr. Crane, after which W. W. Lindley took charge, and later Mr. Mitchell sold the plant to Lindley, who removed it to South Woburn, Mass., where he set it up and began anew. This Mr. Lindley was then husband to the accomplished lady who many years later, after having been long a widow, became the wife of John Ryle.

The Connecticut Silk Manufacturing Company, at Hartford, was incorporated in 1835, and managed by Messrs. Christopher Colt and J. H. Hayden, the former of whom was destined afterward to figure in the early history of the industry in Paterson. This business was a failure and collapsed about 1839, the company having sunk its entire capital. Mr. Hayden went into partnership with Mr. Haskell, at Windsor Locks, Conn., and the business of silk manufacturing continues there in a flourishing condition up to the present. It was about the same time, or a year or two later, that the Atlantic Silk Company, of Nantucket, and the Poughkeepsie Silk Company went down, both having sunk all their capital.

In 1840-41 Cobb's silk mill at Dedham, the New York and Northampton Company, and the Morodendron Company, of Philadelphia, also one or two small companies at Mansfield, went down; but some new enterprises had sprung up, which afterward became more successful. One of these latter was that of the Nonotuck Silk Company; another was the establishment of Captain Joseph Conant, who built a mill in 1838 near Northampton, and in 1852 the great "Conant Mill" at Conantville, Conn. The late Thomas N. Dale, so closely identified with the Paterson silk industry, took his first lessons in the art at Hartford, of the Connecticut Silk Manufacturing Company, above referred to. In 1834 the late B. B. Tilt, another of Paterson's pioneers in this industry, began manufacturing ladies' dress trimmings in Boston. The firm was afterwards changed to B. B. Tilt and Co., and, later, to Tilt and Dexter. In 1855 Mr. Dexter and his associates bought out Mr. Tilt's interest and organized the house of Dexter, Lambert and Co., at Boston, whence they removed to Paterson in 1867.



CHAPTER XXX.

THE SILK INDUSTRY.—ITS ESTABLISHMENT IN PATERSON.

THE period has now been reached when, in the due course of the advancement of the silk manufacture of the country, Paterson, since destined to become its very centre, begins to figure; that is to say in the years 1839-40. It is true that there was a feeble attempt made somewhat prior to 1839, perhaps about 1838, but it was not until John Ryle came to Paterson in the interest of George W. Murray, of whom more hereafter, that the child destined in after years to assume such vast proportions was actually born. The date, as nearly as Mr. Ryle can remember, was either late in the Winter or early in the Spring of 1839-40. The place where the infant enterprise was housed and nurtured until it became comparatively strong and vigorous was in the building for the past forty-five years familiarly known to every Patersonian as the "Old Gun Mill," just off Van Houten street, and near the river bank. In this location about the year 1835-6 "The Patent Arms Manuf'g. Co." built the original mill for the manufacture of the Colt repeating fire-arm, a weapon that has since become famous the world over.

Samuel Colt, a brother to Christopher, who was afterward identified with the planting here of the silk industry, being the first who ever brought any silk machinery to Paterson, was the patentee of the repeating arm, and E. B. D. Ogden, afterward Judge, President of the company, the object being to enlist Paterson capital in the enterprise. The financial backers were a number of New York capitalists, prominent among whom was John Ehlers, who had advanced a large amount of money for carrying on the business. Under these auspices the Gun Mill proper was erected, after the manufacture of the patent arms had been experimentally carried on for a short time in an obscure mill then standing. When finished the mill was, especially for that day, a very fine structure, about 100x40 feet, four stories high, with an attic. On the spire which surmounted the bell-tower was a vane very elaborately made in the design of a finished gun, and in front of the mill was a fence, each picket being a wooden gun, and the whole was beautifully painted. There was a number of small buildings attached to the mill proper, and over the raceway was an office, in which Henry B. Crosby, now senior partner in the firm of

H. B. Crosby & Son, then one of the most valued of skilled workmen for the company, slept for several years. Philip Rafferty, afterward of Todd & Rafferty, was also employed at the mill at this date. He was engaged in April, 1837, when Mr. Crosby arrived at the mill, in building a blacksmith shop. Mr. Crosby had been working at very fine machinery at Springfield, Mass., and was encountered there by Samuel Colt, who said he was just the man that was wanted at Paterson, and he must come—which he did, and stayed with the concern until it collapsed utterly about 1841-2. Mr. Crosby is credited with the honor of adjusting the first lock used on the patent arm and also of fixing on the Colt's revolver the first ramrod lever attachment ever placed on a pistol. He was especially in charge of the lock department.

Even in those days, when the Colt repeating arm, both pistol and rifle, was a cumbrous and complicated machine, it was a tremendous weapon. The difficulty was that it was very costly, and so complicated and liable to get out of order that people generally were afraid to touch it. The arm was made in all variety of styles, and many of the revolvers and guns finished here were of almost Oriental magnificence. Some of the arms were intended for foreign countries, presents being sent to princes, governments and distinguished men the world over, including China and Japan. These were silver or gold-mounted or inlaid, and finished in the most elaborate manner. They were very effective, too, despite their comparatively complicated construction, innumerable improvements having since been made. Scarcely anything remains of the original idea except the revolving chamber, and in those days they were made with an extra chamber to put in when the first was emptied, thus affording fourteen shots without reloading.

A great many of the arms were manufactured, but, for the reasons intimated, and perhaps for others, the enterprise was not a success. The rifle was then sold at about \$60, as nearly as can be ascertained; much too high a price for it to become of common use. The first important use made of the Colt repeating arm was by General Jessup, the great Indian fighter, who was then engaged in trying to drive the Seminoles and other savage tribes out of the everglades of Florida. His experience in this regard is a matter of history. The Indians, hidden in the impenetrable jungles formed by the luxuriant undergrowth of that tropical climate, together with the abundant moisture afforded by the lagunes filled with green and stagnant water, bade defiance to all his efforts. Surrounded by their foes, inhaling at every breath the deadly miasma, bitten by innumerable creatures of the viper family, and plunging into the treacherous pools swarming with alligators and other dangerous reptiles, the soldiers were baffled at every turn. General Jessup acquired the reputation of being a costly and unsuccessful leader, until he finally made a requisition for and secured 600 rifles and revolvers of the Colt pattern, the first of any account ever sold, and largely the product of Paterson skilled workmen, several of whom are still living, engaged in different pursuits.

With these the Indians were finally driven out, and it is stated as a fact that General Jessup remarked that he never could have conquered those savages, "entrenched" as they were, except for these powerful weapons. There is also a statement to the effect that on occasions when the Indians succeeded in capturing a few

of these arms they proved of no use to them, their mechanism being so complicated as almost to need a master mechanic to handle them. The Indians were perfectly demoralized when they saw the soldiers fire from seven to fourteen times in succession without loading; they thought the devil was in the business. Among the most notable for his skill in the manufacture of these weapons at that period was Fred Hanson, the well known gunsmith in Prospect street. Pliny Lawton, from Ware, Mass., was Superintendent of the works.

As already intimated, the business of manufacturing the arm here was a failure; the Government did not adopt it to any extent, and foreign governments were slow to appreciate its great worth. Meantime the expenses of manufacture were enormous, and about 1841-2 the business was closed. John Ehlers, above referred to, being the heaviest investor, through some arrangement with the others took the whole plant, right, title and interest—including, of course, the patent. Samuel Colt is said to have gone from Paterson at that time without a dollar.

Messrs. Murray and Ryle occupied the upper portion of the Gun Mill about two years while the Patent Arms Company manufactured below. When the crisis came, and the Sheriff was expected every moment, about \$60,000 worth of magnificent arms was hidden under the coal and elsewhere. Other property, including a portion of the splendid machinery, was also secreted.

It was just prior to the grand catastrophe that Mr. Colt, sole owner of the patent, offered a half interest to John Ryle for \$5,000. There were "millions in it," as was afterwards discovered. When the crash came H. B. Crosby was a creditor of the company for wages due to a considerable amount, and the only way in which he could secure his own was to take about twenty-five of the different portions of the arm, and these he afterward put together and realized a handsome sum.

Prior to the grand climax Samuel Colt, as representative of the Patent Arms Company, moved heaven and earth to induce the Government to take hold of the arm and adopt its use, but all without avail. On one occasion, of many like ones, Messrs. Colt and Crosby went to Washington, and with them a number of the men best skilled in the use of the weapon, the object being to give a convincing display of its wonderful power. The men were drawn up in a line at the Capitol, waiting for the command to fire, Mr. Colt and a group of army officers holding their watches in their hands to note the time, when the carriage of the President drove up, and the President stepped out and stood on the Capitol steps. Then the word was given and the arches of the rotunda rang with the sharp and continuous detonations. The display was a perfect success, but a most unfortunate and fatal catastrophe spoiled all. The carriage horses of the President, mettlesome animals, were rendered wild with affright at the firing, and were soon beyond all control. They reared and then dashed forward, causing the carriage to strike a gate column with such force that the driver was thrown to a considerable height, from whence he fell on an iron railing and was almost instantly killed. This, it is said, gave the President such a prejudice against the arm that he always opposed its adoption, and so the mission to Washington was a failure. Mr. Ehlers, after he came into possession, tried very hard to get orders from the Government, but failed. Then he went to Mexico and endeavored to negotiate with that government, which resulted in his property being

confiscated as that of an enemy to the country, when the plant, patent right, etc., were offered for sale.

Fortune, as if tired of turning her back on the original patentee, now smiled on him, for at this sale, when the right to manufacture and all pertaining to the arms seemed valueless, there being no market for the product, a friend of the patentee stepped in and bought the whole right back again for the paltry sum of \$50. This man was a New York lawyer, Edward Dickerson, still living, a son of the late Governor Philemon Dickerson, of Paterson. This was the turning point in the fortune of "Sam" Colt; the Mexican war broke out, and his arms were suddenly in demand from all quarters. He was soon at the head of a large manufacturing concern in Hartford, Conn., whither he removed at once when he regained possession. At this time he was heavily backed by his brother Elisha.

The arms were in after years manufactured and sold in almost every European country, and are now in use the world over. Samuel Colt died worth a fortune estimated at \$15,000,000, and yet at one time he had offered Mr. Ryle what was the sole foundation of all this wealth for a paltry \$5,000, then lost it utterly, but bought it back for a "song" through the fortuitous circumstance of Ehlers having rendered himself an alien. Truly it is like a tale of the "Arabian Nights," the difference being that it is substantially true in every particular.

There seems to be no data extant—and there has been a thorough ransacking of books, pamphlets, old garrets, old libraries and old memories alike—to show precisely the date when the first silk machinery was brought to Paterson. It is not of very great importance, inasmuch as nothing akin to success crowned the first feeble effort of the projector of the silk manufacture here; still the failure to fix the date is to be regretted, as quite enough that is interesting in this connection has already escaped from recollection and will probably never be accurately known. Some writers have said that Chris. Colt started the silk manufacture here in 1836; others that it was started first by G. W. Murray in 1840, while the *New York Graphic*, in its very imperfect sketch of the rise of the silk industry, published September 5th, 1876, states authoritatively that "G. W. Murray started in the silk business in Paterson as early as 1836." All this, doubtless, is unreliable, and it will be safest to turn from such uncertain and misleading data and publish the recollections of those who, from their intimate connection with the silk industry, very soon after, are likely to know most of the time when the first attempt to manufacture was made.

From what can be gathered by taxing the memories of these early pioneers, it seems most probable that the first silk machinery was brought here from Hartford, Conn., about the year 1838, by Chris. Colt, a brother of Samuel; and it is thought most likely that he received his inspiration from his father, who was President of the Connecticut Silk Manufacturing Company, of Hartford, which failed about 1839. It may be that he caught the idea from seeing the silk machinery manufactured at Dedham, Mass., where he, Chris. Colt, formerly lived, and where much of the machinery in use at that early day was made, among others, that used on Nantucket Island by the Atlantic Silk Company, as before stated. Subsequent to his attempt here, Mr. Colt was established at Dedham in this line and was quite suc-



John Ryle

cessful. At about the date mentioned Chris. Colt secured permission from the Patent Arms Company, of which his brother Samuel was one of the principal directors, to place his small silk plant on the top, or fourth, floor of the Gun Mill, where he made an attempt to manufacture. In this venture he was backed throughout by Crumbie & Draper, of New York city, who furnished all the means and what is believed to have been the only bale of raw silk ever manufactured by him in the short period of his occupancy. No finished product from this attempt lives in the memory of any one of the many old people who have been inquired of, though it is possible there might have been such. In a very short time the attempt was abandoned, and the machinery was left to rust in disuse.

During the time that John Ryle was working for Mr. Whitmarsh at Northampton, Mass., in the latter part of 1839, he there encountered George W. Murray and wife, who came to Northampton to tarry for a time, it being quite famous as a watering place. Mr. Murray grew to like Mr. Ryle, then a young man of about twenty-two, having been born at Bollington, a suburb of Macclesfield, England, in the year 1817. At the age of five years he was placed in a silk factory at work, and he passed from one branch of the manufacture to another until he was, at a very early age, master of both silk-throwing and weaving.

Mr. Murray was an aged man, nearly or quite an octogenarian, and had been famous as the pioneer manufacturer of white lead pigment, but had lost nearly the whole of an immense fortune by a fire which destroyed his works. He still had some means, however, and, having heard of Colt's attempt to manufacture silk in Paterson, he suggested to Mr. Ryle to try it under his auspices. The silk business was regarded just at that time as somewhat extra-hazardous, all, or nearly all, who had gone into it having failed, and Mr. Ryle was not disposed to venture. Mr. Murray was a very proud and dignified man, who felt keenly the losses he had sustained and his altered fortunes, and was far too sensitive to press the matter, though he did not forget it. In September of that year Mr. Ryle took a holiday and went to New York city to visit some friends. When he returned to Northampton, after a few days' stay, the concern had utterly collapsed, and he thought himself fortunate in having received his salary before leaving.

Having no employment, he returned to New York, and, in connection with his brothers in England, started a silk importing business in a small way. His brothers sent first £100 worth of Macclesfield silk handkerchiefs, which arrived late in the Fall of 1839, by the old "Liverpool," one of the first steamships that crossed the Atlantic. Mr. Ryle established himself in Maiden Lane, and for a time did a considerable business in this line, and was fairly prospering, so that he might, in time, have become a princely silk merchant, instead of a pioneer silk manufacturer, had he not one day chanced to meet Mr. Murray on the streets of New York—a most unexpected encounter. Almost the second word with that gentleman was: "Well, have you seen or heard of a silk factory that we could start up in these parts?" The answer was a negative. "Well," continued the other, "I have, then. There's a silk factory at Paterson that has failed, and the plant is for sale. I want you to go there and examine it thoroughly and see what you think of it, and what it is worth, and let me know." Mr. Ryle said he would go. Mr. Murray obtained the

keys from Chris. Colt in New York, and Mr. Ryle came to Paterson and took a look at the rude and imperfect machinery, then long in disuse. There was winding, doubling and spinning machinery, for the manufacture of sewings and twist, and something in the way of ribbons could be woven, but a silk plant in those days meant, without question, machinery for manufacturing sewings. Mr. Ryle's report was favorable, and two or three months later, either late in the Winter of 1839 or early in the Spring of 1840, Mr. Murray took possession and installed Mr. Ryle in full charge, there being at the first only three or four hands employed.

Mr. Murray paid \$3,200 for the plant, and though Crumbie & Draper had furnished Chris. Colt with the means to start, and thought they were owners, the former got the money by some legal quibble and they lost all they had invested. It seems that their name did not appear in the business, and when the question was raised there was nothing whatever to show for their investment.

The first skein of sewing silk ever put up in this country is said to have been manufactured at the Gun Mill by Mr. Ryle; skeins were sold at the time for about \$2 per hundred wholesale, and retailed for about five cents each. The first spool silk manufactured there was sold to Horstmann Bros. and Allien, of New York.

It is claimed for Paterson that here occurred the first really successful silk manufacture in the country. For, despite all the disadvantages under which these early pioneers labored, the venture was a success, which is more than could be said at that time of any other in this direction. The condition of affairs at this period can scarcely be conceived by those who only know the silk industry as it exists to-day. There were positively no skilled operatives in this section of the country; those who had gained a partial insight during Chris. Colt's brief effort here had gone back to the cotton mills, whence they had been drawn at the first. Everything was to be taught the hands before they could do the work. They needed some one—and that one was found in Mr. Ryle—to stand over them continually, and as the material with which they experimented was costly, the learning to manipulate it was somewhat expensive. Besides this there were no machinists, as now, to manufacture even the most trifling parts of the machinery. If a screw, a bolt or any minor attachment was lacking Mr. Ryle was compelled to direct the workmen and watch the process until he obtained what was needed.

There were no dyers of silk known in all these parts, and the first silk goods that were to be dyed were sent all the way to Philadelphia, to John Jaques Smith; there was no silk dyeing East. Those were the days when a greater portion of what is now occupied by the city of Paterson was grown over thickly with raspberry bushes, and the waters of Dublin Spring brook ran unchecked through the open fields, now portions of the Sixth, Seventh and Eighth Wards.

It was while the enterprise was still young that Mr. Ryle went to New York city to buy raw silk to manufacture, but after running about the entire day he could find but half a bale, the entire stock of the market. The other half had been sold to a small silk manufacturer from Macclesfield, who had established himself at Philadelphia a short time previously. So at that time the entire stock of raw silk in the country, it is almost safe to assume, was divided equally between two obscure and struggling Macclesfield silk manufacturers. It seems scarcely credible

that such a thing should have occurred but forty years ago, and more especially when it is remembered what immense loads of the precious fibre are now daily delivered to the various mills, the poorest of which can exhibit more raw material than the great metropolis could furnish at the time above alluded to. Despite all the discouragements and disadvantages labored under, the infant enterprise grew apace and flourished in a remarkable manner, so that in a comparatively short time—a few years—the product was 800 to 1,000 lbs. of silk per week.

In 1846 the upper or fifth floor of the Gun Mill, a sort of attic hitherto unoccupied, was fitted up, a skylight put in and the place filled with looms. Here some magnificent broad goods were turned out, such as gros de Naples, and other rich dress fabrics, and 1,000 yards at a time was no uncommon consignment to the commission house in New York. It does not seem to be an idle boast, in view of all the facts, to say that Paterson city is really the birth-place of the silk industry on this side of the Atlantic, that the gray and dingy old building known as the Gun Mill may be regarded with all due honor as its cradle and John Ryle as its foster-father.

Two interesting events occurred to Mr. Ryle, then about twenty-six years of age, soon after the business became firmly established in the Gun Mill. The first, and probably the most important of the two, was his marriage to Miss Sarah Morfitt, a most estimable lady, in whose companionship Mr. Ryle spent the next quarter of a century of his life, or thereabouts, Mrs. Ryle dying in 1867. The fruit of this marriage was nine children, of whom three are dead, the survivors being five sons and one daughter. The eldest son is Reuben Ryle, who was at one time his father's partner. About 1870 Mr. Ryle married Mrs. Lucy Lindley, nee Raymond, a most accomplished lady, before referred to, who died early in 1882. Mrs. Lindley was formerly the wife of William W. B. Lindley, a silk manufacturer, of Winchester, Massachusetts. The other event referred to was the admission of Mr. Ryle into partnership with Mr. Murray, the firm being Murray & Ryle from about 1843 to 1846.

At first the rent paid by Murray & Ryle for the fourth floor of the mill was \$400, but, after the attic was altered, and a skylight put in, they occupied that also, and then the rent was \$600 per annum. The third story was occupied by H. M. Low & Co., cotton spinners, who had leased it for a term of ten years. After the Patent Arms Company collapsed the lower floors of the mill were not occupied for several years.

In 1846 there occurred another important event, for in that year Mr. Murray, a very aged man, retired from the business, and Mr. Ryle, with the assistance of his two brothers, who had remained in Macclesfield, purchased Mr. Murray's interest. Enough consideration should be shown to Mr. Murray, who, though not a practical manufacturer, was yet the projector of the first successful effort toward the silk manufacture in Paterson, to follow him a little way after his retirement from any active participation therein. The story is soon told. When he sold the silk business he went to reside with a niece in Connecticut, where he died a few years later at a ripe old age, after a stirring and useful life, one of the later acts of which has left its impress deeply on the city of Paterson.

It was very soon after the retirement of Mr. Murray that Mr. Ryle purchased the Gun Mill from John Ehlers, who still held the title, and the original deed for the property, received at first by the Patent Arms Company, is in his possession to this day ; also the deed from John Ehlers. In all this, and in the enlarged operations that followed, Mr. Ryle was aided by his brothers in England.

In the same year, 1846, his brother William, a practical manufacturer of great experience, came over to see how he was getting on, and was astonished at the progress made in the silk manufacture. He found that the same class of raw silk was being manufactured here as they were manipulating at home ; that is to say, the Indian article, from Bengal, a very fine and beautiful fibre, but also very difficult to manufacture.

After the mill came into possession of Mr. Ryle he occupied the lower floor and leased the second floor, also, to H. M. Low & Co., so that, for the first time in four or five years, the building was fully occupied. But this did not satisfy his ambitious spirit. The business was increasing, and in a few months after obtaining possession of the property, an addition in the form of a small two-story stone mill, still standing, was built in the rear or to the Westward of the original mill. Soon after another building was erected, the walls of which almost encroached on the river. This was the large building that may still be seen there as one of the dependencies of the Gun Mill proper, about which there is much which has been fully explored by a comparative few only, even among the older citizens. This structure is, in size, 167 feet in length, 100 feet of length having a width of 40 feet and 67 of 20 feet. There was probably not another such a wall to any building in Paterson as that on the river front, it being fully six feet in thickness, of solid masonry. This was to resist the action of the water in time of freshets and floating ice ; yet the wall was washed away in the great flood of 1854, but afterward was rebuilt and is still standing. Besides the above a dye house was built about the same date, and the business, carried on under the firm name of John Ryle, assumed a very great importance for that day. During this period, after the abandonment of the attempt at broad silk weaving, the product was tram, organzine, sewings, twists, and material for trimmings, and there were employed in the various departments, from 1846 '7 to 1850 or thereabouts, 300 to 350 hands ; after that date the number was increased to 500, and even more.

A question will naturally arise as to where the additional silk machinery was made at this time, when so little was known of the requirements of the industry. Charles Moseley was, without doubt, the pioneer in this department, and on him the success of the silk manufacture largely depended. Mr. Moseley was with Mr. Ryle from the earliest period of his occupancy of the Gun Mill, first as a machinist about the premises, merely looking after repairs and the like, but afterward as builder of some of the very best class of machinery in use, either then or now. He was a master mechanic, in every sense of the word, and himself invented many improvements which are still in use ; these should have made his fortune, but they did not. Among these improvements may be mentioned the guider or traverse motion, used on winders or spinners to guide the threads in filling the bobbins, so that they were filled evenly, and not in the sloppy manner before in vogue. Mr. Mose-

ley did more than will ever be known to the general public, or even to the craft, to improve the processes of manufacture. His early machinery, bearing his name, is still in use in some of the Paterson mills.



CHAPTER XXXI.

THE SILK INDUSTRY.—ITS GROWTH IN PATERSON.

JOHAN RYLE had no competitor in the silk manufacture for about eleven years, when a rival appeared in the person of the late John C. Benson, called familiarly by his contemporaries, "Yankee Benson," because he came to Paterson first from the East. There were minor attempts, but none worthy of especial note. Giles Van Ness in 1844 began the manufacture of silken tassels, fringes, gimp and other dress and cloak trimmings, in a small shop in Hamburg avenue, whence he afterward removed to a new shop erected by himself in Water street, where he continued the business until his death, in 1864. This was the first factory erected for the silk manufacture in Paterson. Very few hands were employed. Catharine, the widow of Mr. Van Ness, still continues the business in a modest way. In 1847 Christopher Colt made his second essay in the silk manufacture in Paterson, occupying a portion of the Nightingale Mill. The branch was throwing, exclusively. A year or two later he associated with himself Edward A. Bedloe, and about 1849-50 sold out to Bedloe and left Paterson, Bedloe continuing the business until about 1853-4, when he, also, abandoned it.

Mr. Benson was established in the well-known Beaver Mill in the cotton manufacture, and he surprised a great many of those who knew him by at last developing a decided penchant for silk. It is a question whether or not Mr. Benson began to manufacture silk first at the Beaver Mill, but it is thought more than likely that he did. If so, he did not continue there very long, for he soon after built the little brick mill known to this day as Benson's Mill, on Bridge street, near Godwin street. Here he put in a small wheel to be run by the "Dark Brook" and drive his machinery. The Dark Brook at this time ran with little interruption from the Sandy Hill neighborhood, near the Beckwith residence, past the Arkwright Mill site, to the "Button Mill Pond," so called from the old Button Mill standing in Ellison street, in the neighborhood of the Byard market building, and thence through the intervening space to the river near the Straight street bridge.

Mr. Benson was quite successful, being a very persevering and energetic man. His machinery was built by Todd, Mackey & Co. He employed, when in full operation, about 40 hands, the product being mainly sewings and twists. Later he admitted a partner, one Crossley, from New York city, and still later, perhaps about

1860 or 1861, there was a dispute between the partners, the business was closed, Mr. Benson's son-in-law, Daniel Kempton, continuing to run the mill for a time, after which it was rented to Leonard Brothers, who came to Paterson from the East.

The Leonards did not occupy very long, and are now at Warehouse Point, Mass. The mill property was finally sold to Messrs. Thomas D. Hoxsey and David B. Beam. The present occupants are the Paterson Reed and Harness Company.

Mr. Benson lived a retired life after discontinuing his business as a manufacturer, and died a few years ago. He was noted for many things besides the distinction of having been the second to make what may be termed a success of the silk manufacture proper in Paterson, the business of Mr. Van Ness belonging to the department of specialties. Mr. Benson was a man of uncommon intelligence, and, like most New Englanders, held very decided opinions of his own. He was on intimate terms with William Lloyd Garrison, and on one occasion procured his attendance "to make a few remarks" at the funeral of a relative or friend who died and was buried in this city.

Beyond the two men whose early operations in this line are sketched in the foregoing pages, there seems some doubt as to whom belongs the honor of having been the third in order to invade the newly-opened field of silk manufacture. It has been popularly supposed to belong to Hamil & Booth, but there is no strictly reliable account of the rise of the industry which places the date of Messrs. Hamil & Booth's establishment earlier than 1855. This agrees also with their own statement, which should be conclusive. Consequently James Walthall, who began to manufacture on the lower floor of the Nightingale Mill in the rear of J. Nussey & Co.'s shop, as early as 1851, was, doubtless, the third to enter the silk domain, and should be accorded that honor.

Mr. Walthall had at this time a large family, there being nine children, and therefore was "not afraid to meet his enemy in the gates," nor yet his business at the mill, which was run at first entirely as a family enterprise; later, two hands were taken on, John Nichols and Henry Dean. The product was about the same as that of John Ryle, with whom, at the Gun Mill, Mr. Walthall was formerly employed.

In 1853 Mr. Walthall removed to more commodious quarters over the Machinists' Association's factory, which was afterward burned and then rebuilt. The business increased, and in 1854 L. R. Stelle, up to that time editor of the tri-weekly *Guardian*, a gentleman of excellent ability in more than one direction, was associated as partner. At this time there were about 40 to 50 hands employed and much new and improved machinery had been added.

In 1861 Mr. Walthall sold out to his partner, and enlisted in Company I, Second Regiment New Jersey Volunteers, of which Charles Danforth, Jr., was Captain and John Allen First Lieutenant. After the war Mr. Walthall returned and was superintendent for his old partner, Mr. Stelle, the firm then being Stelle & Saunders. Still later he was superintendent for B. B. Tilt at the Beaver Mill, and later still he occupied a similar position with B. Hooley & Son, of the Keystone Silk Mill, Philadelphia, established about the same date as the enterprise of Mr. Murray at the Gun Mill, and which has continued uninterruptedly nearly to the pres-

ent time. Here Mr. Walthall remained about fourteen years, until the death of the senior partner, when, having saved some money, he thought he would try life on the prairies. He went to Kansas, purchased a quarter section, 160 acres, built a beautiful residence, stayed there eight months and then turned his back upon all and returned to Paterson to take some of the very same machinery which he had started with thirty years before, made by Charles Moseley and used for years by Hamil & Booth, place it on the fourth floor at No. 93 River street and begin all over again. In regard to the precedence that is accorded to Mr. Walthall as having been the third to engage in the silk industry, the error in reference to the date of his beginning is probably due to the fact that his operations in the Nightingale Mill were unknown or forgotten by his contemporaries still living, all accounts, except his own, locating him first on the top floor of the Machinists' Association building, where he was found later. From River street Mr. Walthall removed in 1880 to Van Houten street, where he occupies a small place and is still struggling to gain a firm footing.

Mr. Stelle continued in Paterson until about 1873-4, when he associated with him his two sons and purchased a mill property at Sauquoit, Oneida County, N. Y., where a joint stock company has been organized, of which Mr. Stelle is President. They have also a branch factory at 319 and 323 Garden street, Philadelphia. In 1858, when John Ryle was President, Mr. Stelle's name figured as Secretary of the Silk Industry Association of Paterson.

Somewhere about the time that the late Mr. Benson started the silk manufacture there was another who made an essay in the same direction, which effort ought not to be entirely overlooked, although there is no record of it whatever in any of the many books or papers on the subject extant. John Birchenough employed about five or six hands, and was engaged about 1851 as a throwster on commission, his raw material being furnished by John Ryle, then firmly established. Mr. Birchenough is thought to have continued in the business for about five or six years, and there is a "tradition" that during that period he at one time occupied the upper floor in the old Phoenix Mill, otherwise devoted entirely to cotton, but it has been exceedingly difficult to gather any definite data of his operations at any time. The enterprise was never a success, although Mr. Birchenough is described as being a man of much ability and well versed in the manipulation of silk; the business was not an important one, and when it ceased it seems to have passed out of the memory of nearly all the contemporaries of the projector, who is now an aged man, engaged in a small way in keeping a market at Haledon.

The following statement from a relative of Mr. Birchenough is probably as reliable as anything extant:

"I learn that John Birchenough first started manufacturing silk at his house in Broadway, making sewings by hand, or what is known as 'twist wheel work;' this was in 1851 or 1852. In March, 1853, he started manufacturing in a room in the Gun Mill yard, and has always said that when he started the only manufacturers of silk then in Paterson were John Ryle and John Benson. This would give him the third place as a pioneer. While at the Gun Mill he sold a portion of his machinery to James Walthall, who started in the Nightingale Mill with his family. After this Mr. Birchenough leased a portion of the Beaver Mill and subsequently

sub-leased a part to Hamil & Booth, who were there and then for the first time going into the manufacture of thrown silks. Mr. Birchenough has always placed Messrs. Hamil & Booth as No. 5 in the list of silk manufacturers. A married daughter of Mr. Birchenough, now employed at the Phoenix Mill, verifies the above statement of her father's operations. I am inclined to think that this version is correct."

Robert Hamil and James Booth, both practical silk workers, and both employes of John Ryle, began to manufacture silk in the Beaver Mill in 1855, the plant being valued at \$5,000, and twenty hands being employed. A full account of this enterprise will be found in a subsequent chapter.

For a number of years the silk manufacture was confined to the enterprises described. John Ryle, at the Gun Mill, was still very successful and rapidly added to and improved both mill and machinery. In this he was aided by his brothers Reuben and William, both of whom had acquired wealth and high position at home in England. When Mr. Ryle first came to Paterson the population of the village was rated at 7,000; in 1846, to which period the pioneer enterprise has been sketched, the population had increased to nearly 10,000. The *Farmer and Mechanic*, a New York journal, under date of June 15th, 1848, gives a partial description of the establishment at the Gun Mill, then regarded the country over as a most marvelous affair. According to this account there were at that date about 200 hands employed, about fifty of whom were boys, and one hundred and thirty girls. This journal speaks of the enterprise in most enthusiastic terms, and especial stress was laid on the very commendable measures adopted by Mr. Ryle to guard his hands, many of whom were young and thoughtless, from all possible danger by contact with the machinery. The method at this early silk mill, judging from the description given, must have been simply perfect. The business is spoken of as "novel and hazardous," which terms no longer apply, and the proprietor is said to have brought to bear upon this species of manufacture "great experience and more than ordinary energy."

During the early years of the establishment at the Gun Mill the following awards were made to Murray & Ryle and to John Ryle for excellence of product: In 1842, by the American Institute, for specimens of ball twist sewing silk, and floss; 1843, by the American Institute, N. Y., to Murray & Ryle, highest award for twilled silk handkerchiefs and ladies' and gentlemen's cravats, a gold medal; 1846, by American Institute, to same, highest award for colored sewings and twist, and best silk handkerchiefs, a gold medal; 1852, also by the American Institute, award for sewing silk—the best—a silver medal; same year, by same, highest award for printed silk handkerchiefs, a silver medal.

A fair specimen of the capacity of the establishment at this period, was the manufacture of a very large American flag which waved over the Crystal Palace, N. Y., during the World's Fair held there in 1852. About this time, or a little later, Mr. Ryle spent several months in England and on the Continent, and, to complete his knowledge of the silk manufacture, he visited many of the principal factories of France and Italy.

From the time when Mr. Ryle first obtained possession of the business by purchase from Mr. Murray up to 1854 and thereafter he had steadily prospered and had extended his operations from time to time. In 1852-3 he had in his employ-

ment at the Gun Mill a number of the men who were destined afterward to become famous as silk manufacturers on their own account. Among these, besides Messrs. Hamil & Booth, already mentioned, were James Walthall, foreman of the winding and spinning department; J. Jackson Scott, foreman of the twisting—by hand—department; Thomas Thorp, father of Samuel Thorp, at present Superintendent for the Phoenix Manufacturing Co., who had general charge of the outside business, and several others.

In 1854, Mr. Ryle, whose energetic nature was continually leading him to aggressive operations, commenced the building of the Murray Mill, on Mill and Ward streets, so named in honor of his old partner and the pioneer projector of the silk business in Paterson, G. W. Murray. This mill was about two years in building and was, in many respects, a very remarkable structure, especially for that time. In size it was 200x73 feet. At first it was but two stories in height, but later a third story was added. The ceilings of the two lower stories were sixteen and eighteen feet high respectively, giving light, lofty and spacious accommodations for the business, vastly different from the low-ceilinged, cramped and ill-ventilated mills to be found in Paterson at that period. Throughout the spacious rooms, to support the ceilings, were 108 iron columns weighing 1,000 pounds each.

At the grand glorification attending the formal opening of this mill the entire operative force employed by Mr. Ryle, more than 500 in number, sat down to dinner on the top floor, where ample preparations had been made, the great coppers having been brought from the dye house to cook in, and the grand piano from Mr. Ryle's residence to furnish the music for the occasion. It is described as one of the greatest days ever known in Paterson up to that time, and the rejoicing was general. A grand ball followed, and the dance was kept up with great spirit by many who are now staid matrons, not a few of them occupying high positions in society, though they were in that day merely skillful, industrious and well-behaved operatives in the mill. Later, in the Autumn, when the Fremont fever ran high, the upper floor not yet being occupied, there was a grand Fremont demonstration held in the mill, at which Henry Wilson, of Massachusetts, Henry Ward Beecher and other great orators were present, the evening being closed by an immense Fremont ball, in which not less than 2,500 people participated.

The lower floor of the great mill was occupied at once, but the upper portion was vacant for a long time. The mill covered 15,000 square feet of ground, and Brockett, in his book published in 1876, on "The Silk Industry in America," says the Murray Mill was at the period when it was built one of the largest and probably the best equipped silk mill in America.

In 1857, October 8th, or but a little more than a year from the time the Murray Mill was finished, Mr. Ryle failed, mainly through the long credits he, in common with others, was compelled to give. The silk business partook of the general depression that prevailed in that year, and after a brave fight it was found impossible to weather the storm. An adjustment was effected and everything was settled up by January 1st, of that year, when a new start was made, a new firm being formed of John Ryle and his nephew, William Ryle, afterward engaged solely as a silk importer in New York, and recently deceased. The firm name was Ryle & Nephew.

This partnership continued two years, 1858 and 1859, and these were the most profitable of any up to that time in the silk manufacture in Paterson. During this time 2,000 pounds of raw silk per week were consumed—"an amount of business," says Brockett, "at that time unprecedented in America." About this time, or a little later, the weaving of broad or dress goods was again attempted, but the prospect of the war checked this enterprise, since a period of depression in business affairs preceded the outbreak of hostilities. All this time the operations of Ryle & Nephew were confined to the Gun Mill, and to the first floor of the Murray Mill, as Hamil & Booth were occupying the second floor of the latter, from 1857 to 1861. The third story was added in 1878, being finished September 16th, for John Day & Co., who filled it with ribbon looms.

The next Spring, May 10th, 1869, the Murray Mill was burned to the ground, and Mr. Ryle lost a clear half million, not having a dollar of insurance, the mill being considered fire proof. He was, however, to have insured it the next week. This was a case almost or quite without a parallel in the record of so important a manufacturing concern. The fire was communicated from the waste houses of Michael J. Morris, adjoining, where it originated. Fifteen or more tenement houses in the neighborhood were also burned, and scores of families rendered homeless. The mill was rebuilt at once in the form as it now stands, by the Ryle Silk Manufacturing Co., which was then formed, with John Ryle as President; capital, \$100,000. The machinery was procured for restocking the mill from Ashton-under-Lyme, England, where a certain William Wanklyn, a noted silk throwster, had recently died. Everything was purchased and brought over entire, even to the smallest article about the extensive works. The Ryle Silk Manufacturing Company continued until 1872, when it became insolvent, and on the ruins the firm of John Ryle and Sons—William and Peter—was established, and this, after four years, or in 1876, was merged into the Pioneer Silk Company, which still exists, occupying portions of the Murray and of the Gun Mills.

For a number of years, up to about 1864, the silk manufacturers had been greatly embarrassed—handicapped as it were—in their competition with the imported manufactures owing to a duty of ten per cent. on the raw material imposed by the Government. Many and vigorous efforts to have this taken off had been made from time to time, but without result. Among the foremost in this effort, most naturally, was John Ryle, whose energetic nature has always impelled him to grapple with whatever task lay before him and to admit "no such word as fail." A sort of pool was formed in 1864, which included the leading Paterson silk manufacturers, the Cheneys and others, and Mr. Ryle was kept in Washington for a long time—so long that most, if not all, of those who were in the "pool" swam out and in the end left the sturdy old pioneer to surrender at discretion or fight it out single-handed. Of course he chose the latter, and stayed on at Washington, and, finally, against all seeming probability and after all hope had died out with every other than himself—suddenly the announcement came that he had at last been successful. Great were the rejoicings in Paterson when the news came over the wires, and cordial the welcome awaiting the man who had achieved such a vital advantage.

Henceforth the American silk manufacturer would be enabled better to compete with that ever troublesome element, the cheaper labor across the water.

Those who had abandoned the stout pioneer and the effort he was engaged in now felt just a little ashamed, and some of the leading silk manufacturers met together and conferred, and decided that they would bear their full share of the expenses of Mr. Ryle at Washington, which were not light. When approached on the subject, however, it was found that he would make no account, and so there was another dilemma. Finally some one proposed to put together a pretty little sum and beg him to accept it as a mark of esteem from his brethren of the craft, and as part remuneration for the money he had expended. The sum thus given was in the neighborhood of \$3,000, and had it been as many millions it would not have repaid a tithe of the benefit received by the industry through his remarkable shrewdness and irrepressible activity. He was also presented by William Ryle, his nephew, with a magnificent gold watch, which he still wears, as a token of appreciation of his services in this connection.

It would be strange indeed if so public-spirited a citizen, and one who had done so much for the advancement of Paterson, the foregoing being merely a faint sketch of his many and important services, should not be urged to accept some mark of public appreciation. Mr. Ryle, while still a very young man, was possessed of excellent ability, executive and otherwise, a fact widely recognized by his fellow citizens. In 1869 he was selected by the Democrats, to which party he has always firmly adhered, to head the city ticket, when he ran against James Nightingale and was elected by a heavy majority. He made an excellent Mayor, and during his term of office the present coat-of-arms was adopted by the city, the design and motto, *Spe et Labore* (With Hope and Labor) being furnished by Mr. Ryle, who for many years has been regarded, and justly, as a representative citizen of "Industrial Paterson," the hale and strong and pleasant gentleman, now aged about sixty-five, being honored and respected by all as he passes to and fro on the streets of the city that he has helped to make great and prosperous. The people properly, and most naturally, esteem and almost venerate the worthy pioneer and indefatigable promoter of a magnificent industry that he has assisted to rear and foster from the day when he saw it represented by three or four hands, a little rude machinery and a half bale of silk, all on the top floor of the old Gun Mill, until to-day it can boast of 15,000 operatives, great mills filled from bottom to top with the most improved machinery, a consumption of raw material almost fabulous in amount, a production of \$16,000,000 per annum, and, better than all, of the fact that not less than 25,000 mouths in Paterson are fed from "the fruit of the loom."

Thomas Thorp came from England in 1847, and was employed first by John Ryle as book-keeper, but afterward took the entire management as outdoor business man. The account is that about 1855 he began the manufacture of silk in a small way in a portion of what is now the Grant Works, and that after a brief term, perhaps a year or two, or three at the most, he abandoned the enterprise and was with B. B. Tilt in New York, where he was known as Mr. Tilt's "right-hand man," in the silk commission business. When Mr. Tilt came to Paterson Mr. Thorp accompanied him and remained an invaluable attache up to about 1870, when he parted for England and died on the voyage out.

John and Lawrence Ryan started a silk business in a small way, in 1855, in a shed in Jersey street, employing about four or five hands and utilizing "Infant" Lawlor, an overgrown youth, so it is said, as the motive power. The product was "hand sewings," and the concern was short-lived, collapsing in 1857, when many larger craft came to grief, after which John Ryan went to Panama, where he has a position with the Panama Railway Company. Lawrence is employed by John Ryle at the Murray Mill. The building occupied by the Ryans is the same that was afterward used as a waste house by M. J. Morris, in the burning of which the Murray Mill, adjoining, was burned.

During the three years from 1855 to 1858, according to the best authorities on the subject, no new men entered the field, but about 1858-9 and the years that followed immediately after, several new enterprises were started, among others that of C. L. Bottum & Co. Mr. Bottum became connected with the manufacture in the previous year in Mansfield Center, Conn., where he was the partner of one of the Conants. Both came here to try the capacities of Paterson, but their stay was brief. They were located over the Grant Works. A change of partnership induced Mr. Bottum, after a short experience, to return to Connecticut. He sold out to Mr. Conant in 1859, and returned to Mansfield, where he formed a partnership with J. H. Holland, the firm being C. L. Bottum & Co., a flourishing concern.

Mr. Conant soon sold the plant to Edward Saunders, who afterward became quite successful as a silk manufacturer. He continued to occupy the premises over the Grant Works for about two years after purchasing, employing 60 hands. About 1861 he removed to more commodious quarters in the Watson Mill, Railroad avenue, where he employed 150 hands. Here he remained ten years or thereabouts, and in 1870 removed to the old Jaffray Mill on Market street, his business continuing to increase constantly. He occupied this mill until 1875, when he removed to Pittsfield, Mass., where he afterward failed, but where he continued to reside. J. Jackson Scott, afterward among the most prominent silk manufacturers in Paterson, was foreman for Mr. Saunders when he was established here, and after his failure Mr. Scott went to Pittsfield and bought the entire plant and removed it back to Paterson, where it was again set in motion and run with great success until Mr. Scott's death, in October, 1881.

The years 1858-9 were prolific in the establishment of new silk enterprises. Among those who entered the field in that period was Thomas Rowson, brother-in-law of John and father-in-law of John C. Ryle. Mr. Rowson was an eminent silk manufacturer in England, where he was at one time at the head of a vast industry. He came to this country and started in a small way in the mill just off Spruce street, afterwards occupied by A. D. Winfield, J. J. Scott and others. The venture was never very successful, and was soon brought to a close. Mr. Rowson has been dead for many years. His widow, Mrs. Sarah Rowson, is still living in Paterson.

A. Smith, who was called by his "familiar" "Jack o' Clubs," owing to his great obesity, is remembered by the older people as having commenced to manufacture silk in a small two-story mill, fifty feet in length, located where J. C. Todd & Co.'s office now stands, about 1858. This mill had been a bobbin factory, run by one Carter. Here Mr. Smith did quite a business for some time, and, as nearly

as can be ascertained, afterward occupied the old "Cataract City Mill" in the rear of the present Sovereign Shirt Mill proper, the property of J. P. Huntton. A little later he was lost sight of among the incoming crowd of additional silk manufacturers, and no one seems able to tell what became of him.

Ford & McNab are represented as having commenced to manufacture in 1858-9 at the Union Works, where they had quite a large concern for several years, employing perhaps twenty-five to thirty hands. The firm were silk throwsters exclusively. The business continued until after the war of the Rebellion broke out, when E. G. Ford, the senior partner, went out as lieutenant of Company I, Second New Jersey Volunteers, under Captain Danforth. He is now connected with the Machinists' Association.

In 1858 James Tumblety and Robert Singleton began the manufacture of sewings, fringes, twists, etc., in a small shop on the site of the present Phoenix Mill. They employed from twelve to fifteen hands. They sold the business about 1859-60 to Stephen Van Winkle, who lost several thousands in it in a few months, but removing to the Beaver Mill, he continued, retrieved his losses and finally made a success of it. In 1865 he became associated with J. H. Booth and Albert Hoblay, and the existing firm of J. H. Booth and Co. was formed—of which more in a subsequent chapter.

All the silk firms that started in the manufacture prior to 1860 have now been noticed, and it may be well to glance briefly at a very important feature in the manipulation of the precious fibre; to wit: the dyeing. As already intimated, in the early days of the silk industry there were positively no dyers of silk in all the region about Paterson, nor within a hundred miles thereof. Necessity soon compelled the manufacturers to establish dye houses of their own, and this was done by several, while others still sent their product to New York and elsewhere to be dyed. The first who made a business of silk dyeing for the mills were William Brown and James Mayers, who started the business in 1859 under the firm name of Brown & Mayers, in Straight street. About ten hands were employed, but after four years successful operation the senior partner was killed on the Erie Railroad, and the concern was purchased by Albert King, about 1863. Mr. Mayers is an Englishman, and came over to this country in company with John Ryle in 1839. He was for a long time previous to starting in business for himself superintendent of the dye works of Mr. Ryle at the Gun Mill. He is now a very aged man, residing in Mill street, opposite the Essex Mill. Albert King continued the business for the space of about seven years, or until 1870, when he removed the dye works from Straight street to one of the buildings in the Gun Mill yard, where he remained three years longer, when he left Paterson and joined the Oneida Community.

Mr. Brockett in his work on "The Silk Industry in America," gives John O'Neill the credit of having been the first in the field, in the following words: "It should be mentioned, however, with regard to the dyeing business, that Mr. O'Neill was the first to open a dye house in Paterson at which goods were received on commission. He had been carrying on this business in New York city, and moved to Paterson to meet the wants of his largest customers." Mr. O'Neill's dye works were at the corner of Paterson and Ellison streets, where the Weidmann Works are

now. Afterward the firm was changed to John O'Neill & Sons. The business was both silk dyeing and silk manufacturing. It was Mr. O'Neill who built and occupied the fine house on Broadway, afterward the residence of William Ryle, deceased. Mr. O'Neill was very unfortunate, and, after about four years' occupancy of the works, died in the lunatic asylum at Trenton.

Among the earlier experimentalists in the fascinating business of silk manufacture was Aaron Polhamus, the veteran cotton manufacturer, about whom there is a "legend" to the effect that he started in 1858 a little silk business in a shop back of the Grant Works, remained there about six months, failed, and was sold out, and has not touched silk again to this day.

James Nightingale began as early as 1864 and did a considerable business in manufacturing for some years. Later the enterprise did not prove a success and it was abandoned, but afterward he again engaged in the manufacture in a small way, on Totowa hill and elsewhere.

Very few among the many who have brought brains, energy and capital to Paterson, to augment her importance as an industrial centre, displayed more real enthusiasm in that direction, labored more zealously toward the desired end or effected more in the comparatively short space allotted him after he became established in the city, than did the late Thomas N. Dale, the projector and builder of the great Dale Mill, the first object to strike the eye of the stranger arriving in Paterson by the Erie Railway.

Mr. Dale was born at Springfield, Mass., in 1812, and, being naturally active and enterprising, he very early in life found his "pent up Utica" too contracted to satisfy his ambition. While yet a mere youth he borrowed \$50 of his stepfather and went on a whaling voyage, being absent three years. When he returned he repaid the \$50, but had nothing left to commence life on except the experience he had gained. He began with scarcely a cent of capital to trade in buttons and other small wares in a very modest way. He succeeded in amassing \$50, when he found a man named Maxwell with \$100, and the two entered into partnership as dealers in tailors' trimmings. The partnership did not last long, however, but the star of the young merchant was in the ascendant; he rose rapidly and soon founded the house of Thomas N. Dale & Co., which furnished everything used by tailors except the cloth. The concern was soon at the head of their business in this country, and their aggregate sales were millions a year; their annual profits a fortune. The business was carried on in New York city, with ramifications in every direction, domestic and foreign.

The importing feature was most important, and this led Mr. Dale to reside much abroad. He maintained for many years an elegant mansion in Paris, where he dispensed a magnificent hospitality and was courted by thousands both of his own countrymen and of foreigners, as a grand specimen of the princely American merchant. At the same time he had a fine residence in New York city and a villa at Newport, where the family spent some months in Summer each year. It is said that at any time prior to 1870 Mr. Dale might have retired a millionaire, though his splendid fortune was somewhat impaired prior to that date.

It is thought that his penchant for silk manufacture might have been received

through intercourse with Christopher Colt, of the Connecticut Silk Manufacturing Co., of Hartford, and J. H. Hayden, as early as 1835. If so he made no movement in that direction until about 1855, or twenty years later, when the firm began the manufacture of braids, cordings, etc., for tailors' use at Newark, still continuing the importing business as before. In 1862 they came to Paterson, having transferred their operations as silk manufacturers to a part of the New Jersey, now the Grant, Locomotive Works. The firm was composed of Thomas N. Dale, John R. Harris, George Richmond and Joseph H. Brown. In 1865 a charter was obtained, the Dale Manufacturing Company was formed and they began the erection of the vast structure known as the Dale Mill, on Railroad avenue opposite the Erie Railway station. They expected to spend about \$75,000; in the end the mill alone cost at least \$175,000. Mr. Dale by this time had centered all his attention on manufacturing, but he was destined never to achieve his cherished wish, to occupy the whole of this immense structure. His pride was a great obstacle in the way of his success, though it had stood him in good stead to stimulate him in his former gigantic operations. Mr. Dale's career did not end prosperously. He obtained full control of the business about 1866, but his interest in this magnificent property was crushed out under the weight of an accumulated debt and the mill passed out of his hands. He went abroad for a time, came home again to Paterson and was living quietly with his son Thomas N., Jr., when he was suddenly stricken with paralysis or heart disease and died July 17th, 1879, in the 66th year of his age.

Thomas N. Dale was perhaps one of the most widely known of the prominent silk manufacturers of this country. He was enthusiastic on the subject of the industry and was never weary of talking about it, and was full of energy in every direction looking toward its advancement. He was one of the most ardent advocates for protection and did much to secure its establishment, both with tongue and pen. He was, above all things, sincerely anxious for the prosperity of Paterson, for which he foresaw a great future as the centre of a vast silk industry. He was the first Vice President of the Silk Association of America, filling that position from 1876 to the time of his death.

Mr. Dale married in early life a Miss Monson, of New Haven, Conn., a lady of great and varied accomplishments. Mrs. Dale survived her husband several years, but has since died. There are two sons, Thomas N., Jr., and Frederick S., the former a quiet student of an artistic and scientific bent; the latter, who is the younger, partaking of his father's energy and business talent, is engaged in the same line, the silk manufacture, and at the Dale Mill. The general ruin that swept over the elder Mr. Dale's beloved industry, involving capitalist and laborer alike, affected him more than the scattering of his personal accumulations and for a time imperiled his reason. He was a grand example to workingmen and employers alike of that democracy of American industry, which gives the capitalist a more real interest in the eyes of the people whom he hires than titled honors would inspire, while he was equally exposed as his humblest operative to the reverses of industrial disaster. His was such a career as best answers the cynic sneering at free institutions, and the Communist declaiming against Capital as the oppressor of Labor.

The Dale Mill site was purchased by Mr. Dale of the Society for Establishing

Useful Manufactures, it having formerly been a part of the old "Colt Pond." Andrew Derrom, the architect, was placed in full charge of the erection, being given a *carte blanche* by Mr. Dale. The building has a frontage on Railroad avenue of nearly 300 feet, and a total area of flooring aggregating 75,000 square feet; 1,500,000 bricks were used in its construction, and the engines and boilers alone cost \$60,000. According to Colonel Derrom, the mill and equipment cost a quarter of a million before it was occupied. One feature of the interior arrangements, as they existed during the lifetime of the late Mr. Dale, is worthy of especial mention. A portion of the building was set apart and finished up with deadened walls, as a library, and so completely was this effected that no noise of the movement of machinery or of the vast operation going on about could penetrate this quiet nook. Here the scholarly manufacturer, whose character displayed a fine blending of the æsthetic and the practical, would retire and engage in those studies a familiarity with which made him so eminent among his contemporaries. In this library were fine paintings, mainly by members of his own accomplished family; also, a mineral collection of great value.

It is with a feeling of natural regret that one is reminded how all this, with the dream of its then proprietor, has passed away; how, though the splendid building still remains, a monument of the energy and enterprise of its projector, the fertile brain, once so active in directing and promoting all connected with the vast industry, was never destined to realize the grand future which was looked forward to with confident enthusiasm.

About the year 1865 a number of New York gentlemen of wealth and of no little enterprise, prominent among whom was Charles A. Buckley, conceived the idea of starting a silk velvet mill and forming what was called the "American Velvet Company." They went first to Newark, where they began to manufacture, but finally came to Paterson and about 1866 built a fine mill, now occupied by William Strange & Co., and still known as "The Velvet Mill."

A whole ship load of machinery and operatives, also an immense quantity of cocoons, were brought over from Europe and the enterprise was started in a liberal manner. It was very short-lived, and about 1868 it all was over. John Ryle purchased the machinery, the second plant of spun silk machinery in this country, Cheney Brothers having the first in their establishment in South Manchester, Conn. The machinery is said to have cost \$125,000 in Europe. Mr. Ryle paid about \$50,000 for it.

The manufacture of silk velvet requires peculiar machinery, as the back is of spun silk and the face of reeled silk, to form the plush. The new firm thought that a brilliant future was in store for them, as velvets were very costly on account of the war. They had a very peculiar loom, a new invention, by which it was claimed that two pieces of velvet could be woven at once, together, connected by the nap or plush, and afterward cut asunder, or "split" as it were, with a circular knife as keen as a razor. It was very ingenious, and when the fabric itself was not cut into by this knife in parting the cloth, the nap was left on both surfaces.

But the venture was not a success, and soon there was no more heard of the silk velvet manufacture in Paterson. The property purchased there consisted of an

entire block, the mill fronting on Essex street, three stories in height, and ranking even at this day among the finest in Paterson. The plant, too, was superior in every respect. William Souter, father of the late Superintendent of the spun silk department for the Pioneer Silk Company, was Superintendent for these ill-advised capitalists. One of the curious incidents connected with this effort was the reshipment to England of the cocoons, an immense quantity, brought thence at the first. These, when soaked, as they must be before manipulation, emitted a dreadful stench, and the water discharged into the Dark Brook went meandering down, poisoning the air on its way. The people living in the neighborhood threatened summary measures, and thereafter the water was surreptitiously emptied at night. But this also was discovered and the firm were compelled to abate the nuisance altogether. The offensive cocoons were reshipped and sent back, as there was no market for them here, Cheney Brothers importing their own.

The peculiar machinery alluded to was the invention of Samuel Holt, an English machinist and manufacturer, who is elsewhere spoken of in connection with his production of "Turkish" towels. Mr. Holt was induced to come to Paterson and introduce his patent velvet loom. During its brief existence the company produced about 5,000 yards of velvet and plush of a superior quality, the capacity of the factory being great. It was a lack of harmony among the projectors, more than any other thing, that broke up the concern. It is said that the company sold Mr. Holt's patents for a quarter of a million dollars.

In 1864 the firm of J. H. Booth & Co. began manufacturing tram and organzine, and in 1866 three new concerns, at least, were established. Dunlop & Malcolm (John Dunlop since 1873) built the mill known as the Union Silk Works, on Straight street, for the manufacture of sewings and machine twist. John D. Cutter started business in the same branch, at first in partnership with D. B. Grant. Afterward the firm was changed to Salter and Cutter, and still later to J. D. Cutter, who continued the business alone. The beginning was made in rooms over the Grant Locomotive Works machine shop and 100 hands were employed. When Mr. Cutter, who has since removed to Newark, became sole proprietor, the concern bore the title of the Excelsior Manufacturing Company.

About 1865 E. J. Watson, a son of ex-Mayor William G. Watson, began the manufacture of silk in a modest way on the top floor of the Union Silk Works, Morton street, corner of Straight street, built and partially occupied by Dunlop & Malcolm. The business of Mr. Watson was at first small, about thirty-five to forty hands being employed. Later the firm of W. G. Watson & Sons—the ex-Mayor and his sons, Edward J. and William—was formed and occupied a portion of the Watson building on Railroad avenue, which was burned October, 1872, and again June 28th, 1875. Before the last named date the firm had been changed to E. J. Watson & Co., the "Company" being W. R. Edwards and H. Cunningham. After the firm dissolved E. J. Watson occupied for a time a portion of the Jaffray Mill, but only for a brief period; he became insolvent and was employed as a silk salesman by the late J. Jackson Scott, and others. His tragic death on the Erie Railway at the Market street crossing, in 1879, is still fresh in the memory of many citizens.

In 1867-8 Frederick Baer (not Baare) came to this country and to Paterson

from Switzerland, and, backed by E. Walther & Co., began to manufacture silk at the "Excelsior Mill." He was a practical weaver, and a very able and skillful man. The product was mainly ribbons. He had perhaps a dozen looms and eighteen to twenty hands employed at first, but the business increased and a mill was built on Rip Van Winkle avenue, when more machinery was purchased and a much larger number of hands were employed. Mr. Baer failed about 1871-2, and the plant was bought by Sterrett, Ryle & Murphy—Charles N. Sterrett, Reuben Ryle, and Boethius Murphy, the later afterward confidential clerk for William Ryle in New York city—who were in occupation until 1877-8, when the firm failed. The plant was purchased by Peter Ryle, and, the mill being refitted and new machinery of the most improved patterns added, the Crescent Silk Manufacturing Company was formed under very favorable auspices. While Sterrett, Ryle & Murphy were in possession Mr. Baer remained as Superintendent. Subsequently he was employed by the Pioneer Silk Company in the same capacity.

Philip Walmsley, a very cultivated and high-toned gentleman, came from England and was with Thomas N. Dale as Superintendent at the Dale Mill for three years, soon after the business was started. Afterward he engaged in business for himself in the Greppo Mill, on Slater street, was there about two years, found silk manufacturing not his forte, dropped out of the ranks, and became a prominent commission dealer in spun and thrown silks in New York city.

William R. Edwards began business first in company with Thomas Wrigley, on Railroad avenue, the firm being Wrigley & Edwards for about six months. Mr. Wrigley then sold his interest to C. M. Martin, and Edwards also soon sold his share to Martin, remaining with Martin for about three years, after which, in 1872-3, he again engaged in business for himself, in the mill of Daggers & Row. Martin employed about twenty-five hands.

After his new start Edwards employed ten hands, on sewings mainly. After a stay of less than a year he removed to the Watson Mill and entered into partnership with E. J. Watson and H. Cunningham, the firm being E. J. Watson & Co.; was burned out there soon after, in the great Watson Mill fire of 1875, and started again in what is now the Manhattan Shirt Mill; remained there about one year, employing thirty hands and doing a considerable business. He failed in 1876, but started again very soon, manufacturing on commission, in the Smith & Jackson building, for the Wortendyke Company and others. He stayed there about one year and in 1877 went to Yonkers, as foreman for W. H. Copcutt, where he stayed until August, 1879. He went to Philadelphia in October, 1879, as foreman in a silk mill there.

In 1866 the firm of Dexter, Lambert & Co., which grew out of the Boston firm of B. B. Tilt & Co., purchased a mill site on Straight street, Paterson, their present location, erected a large mill and transferred their extensive business from "The Hub" to the new and rapidly growing centre of the silk manufacture. A detailed account of this important industry will be found in a subsequent chapter, devoted to a description of existing establishments.

In 1869, June 26th, the first organized effort was made to unite the silk manufacturers of the country for their common benefit. A meeting was called in New

York, over which the late William H. Horstmann presided, and it was resolved to combine for the better representation of the silk manufacture at the 38th exhibition of the American Institute. The National Association of silk manufacturers was formed on the 2d of July following, among the officers being Robert Hamil, President; Frederick, Baare, Vice-President; Albert Tilt, Treasurer; James S. Shapter, Secretary. Messrs. William Strange and John C. Ryle were among the managers. Out of this germ grew the Silk Association of America.

The next step taken in that direction was by the Silk Industry Association of Paterson, which reorganized in May, 1872, with the following officers and board: President, Robert Hamil; Vice-President, William Strange; Treasurer, L. R. Stelle; Secretary, J. P. MacKay. Managers—T. N. Dale, C. Greppo and B. Salter. This local organization was founded first in 1858 with John Ryle as President and L. R. Stelle, Secretary, but had not shown any marked activity. In 1872, June 26th, the Silk Association of America was formed in New York city, forty-four firms and companies joining at once.

About 1871 J. Jackson Scott began to manufacture at the Union Works, employing ten hands, and remained there seven years, running at first but one frame. He removed from that location to the Grant Locomotive building, where he employed 100 hands and ran 72 spinning frames, the product being tram, organzine, twist and sewings.

The same year, 1871, saw the arrival of Fred Baare, who had been for several years established at Schoharie, N. Y., where he had a large mill and was producing broad goods, ribbons, galloons, tassels, etc., including also umbrella silks, for which John Ryle, of Paterson, was a customer. After coming to Paterson Mr. Baare founded the Baare Silk Manufacturing Co., which included John C. Ryle and John P. MacKay, and which occupied a portion of the Murray Mill. The firm afterward dissolved, and Mr. Baare had a mill at the head of Marshall street, where Miller & Brown were subsequently located. He remained at this place until about 1877 when he went to Philadelphia as agent or superintendent, stayed there two years and is now manufacturing on commission in the Van Houten street end of the old Byard Market, now the "Central Silk Mill," of which John C. Ryle & Co. have the Southern, or Ellison street, end.

In the year 1871, or thereabout, Pelgram & Meyer started in the business. Mr. Pelgram was formerly a clerk in the office of William Strange & Co. Mr. Meyer had made much money in trade during the war. They began first at the corner of Ward street and Railroad avenue, where they were followed by S. M. Meyenberg, about 1873. Messrs. Pelgram & Meyer removing to their new quarters on Matlock street. Here they built new mills and added to their facilities until this establishment is one of the very largest, in silk exclusively, in Paterson.

In the year 1871 2 P. Moore began the manufacture of dress goods in Paterson. In 1873, A. Soleliac & Sons, who in 1869 began the silk manufacture in New York, came to Paterson and established themselves on the second and a part of the third floor of the Dale Mill, the firm at that time being described as one of the largest manufacturers of ribbons in the country, employing about 200 hands. Dress goods were also a specialty. Mr. Soleliac the elder had been an importer of many years

standing and was accomplished alike as a merchant and a manufacturer. He had been connected with the silk manufacture at Lyons, France, and had also, at another time, carried on a ribbon factory in New York city. The firm failed in Paterson about 1877.

In 1873, S. M. Meyenberg, who had been of the firm of Meyenberg, Prall & Co., established himself at first at the corner of Ellison and Paterson streets, but after its vacation by Pelgram & Meyer he moved into the mill at the corner of Ward street and Railroad avenue, where he remained until near the close of 1881, doing an excellent business, largely in specialties.

Before coming to Paterson, Mr. Meyenberg had been a member of the firm of Wolfsohn, Meyenberg & Co., New York, manufacturers of trimmings and nets. This firm was dissolved and the firm of Meyenberg, Prall & Co. formed, in 1870, and silk weaving commenced. The panic of 1873 broke up the partnership, but soon afterward Mr. Meyenberg invented an imitation bordered lace veil, obtained by printing white netting with black flecks, and he came to Paterson to obtain increased facilities. The business was removed to Hoboken, where an extensive mill was built, during 1881.

In 1871, or thereabout, Messrs P. & I. Bannigan, two bachelor brothers, who had been carpenters about the silk mills, started in a very small way in the Nightingale Mill. Afterward they occupied space over the Machinists' Association's building. For some years past they have been manufacturing at their farm at Lakeview, and have extended their business greatly. At first they were only throwsters; now they manufacture dress goods, handkerchiefs, ribbons, a great variety, employing from 175 to 200 hands.

J. H. Bowman, a son-in-law of ex-Mayor Watson, began to manufacture about 1872, at the corner of Spruce and Market streets with 30 hands, and afterward removed to a portion of the Watson Mill on Railroad avenue, and there he remained for a time, his specialty being spool silk, until he was burned out in the great fire. He then became a salesman for Messrs Hamil & Booth.

Grimshaw Bros., three in number, John, George, Jr., and David H., came to Paterson from England practiced silk operatives, and soon made wonderful advancement. They commenced about 1872 in Pearl street, and removed afterward to the Union Works, where they ran from four to five looms; soon they had two establishments, having leased a portion of the Dunkerly Mill, and employed a hundred hands. Next they are found at the Arkwright Mill, where they employed about 250 to 300 hands, making serges, handkerchiefs and novelties. In 1878 they purchased the magnificent property known as the Greppo Mill. Here they are continually making improvements, having, with other things, sunk a well 150 feet in depth, at a cost of about \$5,000, which furnishes a plentiful supply of excellent water. About six years after their arrival in this country they employed 500 to 600 hands and took rank with the most flourishing silk manufacturers of Paterson.

John P. MacKay, to whom reference has been made, as one of the Baare Silk Manufacturing Co., established himself in Water street in 1872, and was soon doing a lucrative business, with over 100 hands employed. Joseph Fletcher was established in 1873, mainly in throwing, at 119 Tyler street. A. Urbahn has been manu-

facturing since about 1874, in River street corner of Paterson street ; product, scarfs, neckties, silk suspenders, etc. Southworth Brothers, who make broad goods, dress fabrics, handkerchiefs, etc., were established about 1875, in which year Ashley & Bailey also commenced ; also H. H. Freeman & Co., and several others.

About this date and subsequent thereto there were numerous additional new firms, so that it is extremely difficult to fix the date of their coming. Louis Franke, who started in New York in 1863, as a manufacturer of fringes, braids, tassels, cords, etc., and after 1870 of sash ribbons and marabout trimmings, about 1876 removed his braiding works to Paterson, and commenced in Pope's Mill, where he remained until the erection of the new Franke Mill, in 1881.

About 1874 George Singleton commenced to manufacture in the Watson Mill on Railroad avenue, mainly on commission for Charles N. Martin, heretofore alluded to as having had throwing done here, first by W. R. Edwards, at Wrigley's, three years ; afterward by J. H. Bowman at the Watson Mill, about one year, afterward by Mr. Singleton, who continued manufacturing in the same place until burned out at the time of the last Watson fire. He then employed 40 to 50 hands. He removed to the Jaffray Mill and remained there until the Watson Mill was rebuilt, when he went back to his old quarters, where he still remains, employing about 150 to 175 hands on yarns, sewings, twist, etc., on commission, the product being upward of 150 pounds weekly. Mr. Singleton, who is endowed with a great faculty for invention, has patented a new machine which performs three distinct processes in silk throwing at once, including the spinning. He is interested as principal partner in the Singleton Silk Manufacturing Co., of Dover, also.

The establishment of all, or nearly all, who entered the field of silk manufacture prior to and about the Centennial year has been noted in the foregoing sketch. Long before this time the silk industry had become so firmly rooted, and the movement so general, that the fact of a large silk mill being built or of a new firm beginning to manufacture was no longer singular, or notable. There occurred a period of partial depression for a few years during the height of the panic, in which there was but little advance, comparatively ; still the industry held its own, far better than almost any other, some firms being compelled to succumb but others stepping into their places and filling up the ranks, so that there was really little or no decline at any time. When the cloud began to lift, about 1877-8, there came a revival that has been increasing throughout the three or four years that have since elapsed, new mills and new firms starting up on every side in number almost incredible of belief.

During the same time all or nearly all the old established concerns have been steadily increasing their facilities until the magnitude of the industry at the close of 1881 was far beyond what any, except the few who have taken note of the influx and of the vast additions made, have the slightest conception of. These later arrivals it is not necessary to notice here, for the same reason that comparatively little space has been given in this chapter, on the growth of the industry, to many of the above-named, as a more detailed description of each establishment will follow.

Up to this point comparatively ample space has been devoted to a descrip-

tion of the operations of earlier manufacturers, a number of whom have fallen out of the ranks, for one cause and another (several having died within the few years past), and less to those more recently established, for the reason that to the former there will be no occasion to return; also, for the added reason, that although the mill owners of the present day do an incomparably larger business, and cover far more ground with lofty and capacious factories than did their predecessors in the field, it must nevertheless be admitted that the pioneers have not yet been surpassed in pluck and enterprise by any who have succeeded them, and they deserve, and should receive, the credit which is their just meed from the men who have, to a certain degree at least, benefitted by their experience and who reap the fruits of their victories.

During the period reaching from the first establishment of the silk industry in Paterson down to the Centennial year, there was, as already intimated, a great advancement made in the excellence of product, and it is on record that the fabrics of Paterson silk manufacturers were recognized by the judges at the various industrial expositions in the most flattering manner and bore off honors higher and more numerous, comparatively speaking, than those of any of their contemporaries.

Besides those already noted as having been awarded to Murray & Ryle, John Ryle and other of the pioneers, the following manufacturers were distinguished in like manner in later years: By the American Institute, 1851, to F. S. Dumont, silk plush—best; silver medal. By the same to Duncan Macfarlane (now Superintendent for the Phoenix Manufacturing Company, late with Dexter, Lambert & Co.) fourteen pieces silk ribbon—\$10 and a bronze medal. By the same, in 1867, to the same, a second award—silver medal and diploma, for silk shawl. By American Institute, 1869, to Dale Manufacturing Company, silk serges, scarfs and braids—best; medal and diploma. By same, same date, to Hamil & Booth, organzines twisted in the gum, machine twist and embroidery silks—best; medal and diploma. By same, same date, James S. Shapter, silk serges, black satin, cotton filling, dress silk, reps, etc.—second best; medal and diploma. By same, same date, to Frederick Baare, silk and wool poplins—second best; medal and diploma. By same, same date, to William G. Watson & Son, black and colored sewings, machine twist, canton in gum, black and colored—second best; medal and diploma. By American Institute, 1873, to Phoenix Manufacturing Company, fancy silk goods—best; and ribbons—a silver medal.

CHAPTER XXXII.

THE SILK INDUSTRY.—REVIEW OF THE TARIFFS.

CERTAIN important facts in the history of Paterson's silk industry should here be noted: first, the weaving of dress silks was not successful as a business during the whole period prior to the tariff act of 1861, though broad goods did, as already shown, occasionally make their appearance and of excellent texture and quality; second, that under the low tariff there was no competition in this manufacture for the space of about twelve years, and when, under the tariff, competition did begin, it was very limited in character and extent; third, that under the high tariff of 1861 Paterson became the centre of a great silk industry in which, as shown, many prominent firms became engaged and large amounts of capital were invested. The competition increased year by year, and the manufacture soon included a wide range of goods, many of which had never been made in Paterson—some of them not on this side of the Atlantic—before, and the weaving of broad goods and fancy dress silks generally was fairly established and was found to be remunerative.

These facts are the more noteworthy when the circumstances are considered: Paterson had from the first the advantages of an abundant water power, proximity to a great commercial centre and excellent facilities for transportation. It is true as regards the first mentioned that great power is not needed for a silk mill, and steam is considered by many very nearly or quite as economical as water for driving light machinery, but it must be remembered that water in large quantities and of fair purity is essential for various processes of the silk manufacture, especially in cleansing the silk by repeated washings to bring out its natural lustre; also for dyeing purposes. This pure and ample water supply was found here. Then there was the advantage of cheap labor, a most important factor. At an early period the mass of the people of Paterson were of the laboring class. The men were employed largely in the shops; the women and children seized gladly the opportunity afforded to earn their share by employment in the silk mills. The work calls for care and dexterity rather than severe and protracted effort; it is as cleanly and wholesome as any factory work can well be. In the early days the women of Paterson regarded it as an honor to be employed in so beautiful an industry.

Yet, despite the advantages enumerated, very few manufacturers came under the low tariff. Under that of 1861 they came in crowds. By their own competition they raised the price of labor, and it was further augmented by the factitious values of the war period. That the prosperity would always be uniform, even under all the advantages offered and with a protective tariff such as we now have, could not reasonably be expected. Other elements may enter in to disturb these favorable conditions and for a time render the industry less successful, but if both employer and employed remain true to their own best interests the promise is that there will always be abundant work to keep the people busy and make Paterson an increasingly prosperous city.

A brief review of the various duties on silk, raw and manufactured, from 1790 to the present date, will not be devoid of interest in view of the vital importance of protection to this beyond almost any other industry: By the tariff act of 1790 a duty of $7\frac{1}{2}$ per cent. *ad valorem* was imposed on importations of manufactured silk; by the tariff of 1792 the duty was increased to 10 per cent.; in 1797 it was increased to $12\frac{1}{2}$ per cent.; in 1804 to 15 per cent.; in 1812 to 30 per cent. This was at the time of the war with Great Britain. In 1824 the duty was reduced to 20 per cent. The sectional excitement of the South against the North resulted in 1832 in a reduction of the duty on silk manufactures from this side the Cape of Good Hope to 5 per cent.; from beyond the Cape, to 10 per cent. By the same act a duty of 40 per cent. was levied on sewings, and $12\frac{1}{2}$ per cent. on raw silk. On March 2nd, 1833, Mr. Clay's Compromise Act abolished the duties on manufactured silk from this side the Cape, except sewings. Raw silk remained the same. There were further provisions of this act looking to a gradual reduction of all duties on foreign imports, which reduced, in time, the duty on sewings to 26 per cent. By the act of September 11, 1841, the duty on manufactured silk was fixed at 20 per cent. In 1842 the duty on silk manufactures was increased to 30 per cent. Raw silk was placed at 50 cents per lb. In 1846 raw silk again was made subject to a duty of 15 per cent., and in 1861 it was made free. In the year 1857 the duty on manufactured silk was fixed at 24 per cent.; in March, 1861, it was advanced to 30 per cent., in August of the same year to 40 per cent., and in June, 1864, to 60 per cent., at which it still remains. By act of February, 1875, all silk goods containing over 75 per cent. in value of silk were made subject to a duty of 60 per cent. The first revenue actually received by the Government from raw silk is stated by Dr. Young to have been in 1823. The duty on raw silk continued at 15 per cent. from that time to 1832, when it was reduced to $12\frac{1}{2}$.*

A very curious state of affairs existed when Mr. Ryle first began in Paterson, in 1839-40. Those who follow closely the history of the various tariffs imposed, and the alterations therein, will see that by the Compromise Act of Mr. Clay in 1833 all duty on manufactured silk, except sewings, was abolished. Raw silk was subject to a duty of $12\frac{1}{2}$ per cent. Under such a condition of things Mr. Ryle be-

*Brockett places the date of the Act making raw silk free as 1857, but this is very evidently a mistake. He also makes the Act of 1841, fixing the duty on manufactured silk at 20 per cent., to include raw also, and at the same rate of duty. This, also, is obviously an error: the duty on raw remained unchanged, at $12\frac{1}{2}$ per cent., from 1832 to 1842, when it was made 50 cents per lb. of 16 ounces, including all silks in the gum, in hanks, reeled or otherwise.

gan to manufacture; there was not only no protection, but the raw material was subject to a duty. It is a matter of wonderment how the industry could thrive at all under such circumstances. Its continued existence is partially explained by the fact that importers of manufactured goods were making such enormous profits that there was still a margin left, and the domestic silk manufacture was so feeble and its products so small that it was beneath their notice; in fact was entirely overlooked. At times, when there was a sudden demand for any special style or color, the small domestic manufacturers would seize their opportunity and enter the market, often before the goods could be procured in quantities from abroad. In this way the industry managed to exist, heavy blows being given from time to time in favor of protection by an increased duty on manufactured silks and a decrease or total abolition of the duty on raw.

During the early years that followed his start at the Gun Mill Mr. Ryle was so frequently found in the halls of Congress in reference to this matter, and in other places where national legislators do most congregate, that he became almost ashamed of his own persistence, and it was no uncommon salutation in those days to hear from some one of the many Congressmen and Senators whom he approached on the subject, "What! You here again?" But he gained more or less advantage in the end.

Soon after Mr. Ryle got fairly established in Paterson, his brothers in England, finding he was compelled to pay a duty of 12½ per cent. on raw material while the manufactured article came free, conceived the brilliant idea—and it was a good one—of shipping to their struggling brother John a lot of tram, and the first invoice amounted to about 300 lbs. To John Ryle's surprise the revenue officers demanded the duty imposed upon raw silk. Mr. Ryle expostulated; told them that much more than half the labor had been performed on these goods, and that it was certainly manufactured silk. He tried to explain and show them, but they waved him off and Cary & Co., his agents in New York, paid the duty, under protest. There was more imported in the same way, the duty being always paid, but under protest, until Cary & Co. had a claim against the Government of over \$8,000. Then the matter was taken to the court, Judge Thompson presiding. Samples of raw and thrown silks were produced and Mr. Ryle and others were asked to explain, all the processes being described. The point made in favor of the Government was that it was still in the gum—not cooked, not boiled—but it was shown that this could not be done until a later stage and until it was found what purpose it was to be put to; it must be so far advanced in manufacture before washed or it would be useless except for spinning. David Hadden, a prominent New York silk merchant, still living, was placed on the stand and the Judge asked: "If you should send an order abroad for raw silk, what would they send you?" "Why *that*," pointing to the raw silk. "You would expect in no case to receive *this*?" continued the Judge, taking up a skein of thrown silk. "No, sir," was the ready answer, "that is manufactured." The result of such testimony was a verdict in favor of plaintiffs for the full amount, and in the next tariff on raw silk it was described as "silk as reeled from the cocoon; not twisted or doubled," etc., and it has been so described ever since. Mr. Ryle bore a prominent part in winning other triumphs in this field, including

the abolishment of all duty on raw and the increase on manufactured silk to 60 per cent., the crowning victory of all, and his invaluable services in connection therewith have been, and still are, fully recognized by those who enjoy the fruits in these later years.



CHAPTER XXXIII.

THE SILK INDUSTRY.—INDIVIDUAL SKETCHES.

DEXTER, LAMBERT & CO.

“DEXTER” AND “LAMBERT” MILLS, PATERSON, AND “BELLEMONTE” MILL, HAWLEY, PA.

THE firm of Dexter, Lambert & Co., whose removal from Boston to Paterson has been noted in a preceding chapter, was organized in the year 1853, by Anson Dexter, who had previously associated with the late Benjamin B. Tilt, as a partner in the firm of Tilt & Dexter.

Mr. Dexter purchased Mr. Tilt's interest in that firm, and admitted as partners Messrs. Catholina Lambert and Charles Barton, and together they continued the business under the firm name of Dexter, Lambert & Co. In the thirty years that have since elapsed changes have taken place in the membership of the firm, through death and the admission or withdrawal of its members, but no change has been made in the name of the firm, which now outranks in age any other in Paterson engaged in the silk manufacture, save that of John Ryle.

One of the principal reasons for the retention of the original name was that Anson Dexter, upon retiring from the firm a score of years since, assumed that the business was left in good hands, and, proud of the name and fame of the house which he had taken such an active part in establishing, requested his former associates to continue the business under the name of Dexter, Lambert & Co.

If it were possible for Mr. Dexter, who withdrew from the firm twenty years since, and who died many years ago, to return and visit the present business which has borne his name so long, its existing proportions would surprise him, its untarnished name and its position in the front rank of silk manufacturers would afford him pleasure, and there would be no reason for him to regret that his request regarding the use of his name had been complied with. Under such circumstances, who could measure the satisfaction with which he would review the history and fortunes of the house to which he had been a father?



The firm first occupied as a factory a two-story frame building 100x40 feet, located on Coventry street, so named by Mr. Tilt and which has since retained the name. The machinery first used by them consisted of looms for weaving fringes and gimps, gimp machines, spinning wheels, braiding machines and a small plant of throwing machinery, capable of producing twenty-five pounds of sewings per day. They were at that time engaged in manufacturing upholstery, military, parasol, millinery, hatters', furriers', cloak and dress trimmings, and were, in fact, what was called in those days a trimming house. They, or rather their predecessor, attempted ribbon weaving, in 1849, but it was not a success, financially, for the greater part of the ribbons made, not being sold, were purchased by Dexter, Lambert & Co. at the time of their organization. This, it is said, was probably the first attempt at ribbon weaving in the country; if so, to this house belongs the credit of being the pioneers in this branch of the silk industry.

In 1856, having taken from a New York importing house what was then considered a large order for ribbons, the firm again started ribbon weaving. This venture, like the previous one, proved unprofitable, but from this time forward they continued the manufacture of ribbons until success rewarded their efforts, and in the prosecution of this branch of their business they have, from time to time, made important additions in the way of new and improved machinery and appliances. Up to 1856 no other concern, excepting Andrae & Roth, of New York, is known to have made any attempt in this direction.

The increasing business of Dexter, Lambert & Co. obliged them to provide added facilities for manufacturing, to meet which they, in 1856, commenced the erection of a three-story brick mill 160x50 feet, in Lennox street, Boston. In 1858 the firm had met with sufficient encouragement to justify them in sending Mr. Barton to England to purchase additional looms for ribbon weaving, and other machinery, and this plant was placed in the new mill, just erected.

At this date the consumers of silk were few in number, and principal among them was W. H. Horstmann, of Philadelphia, and the subject of this sketch, Dexter, Lambert & Co. These houses were the largest purchasers of silk in the trade, and at that time Paterson, through John Ryle, furnished them with the silk they used, but subsequently Dexter, Lambert & Co. obtained supplies from Hamil & Booth. From the foregoing it will be seen that although Dexter, Lambert & Co. were originally a Boston house they have always been closely identified with Paterson, having made it their base of supply for over thirty years.

The year 1860 found the firm with a large and extended business which obliged them to maintain stores and carry stocks of goods in large cities, such as New York, Boston, Philadelphia and San Francisco. In 1861 Anson Dexter retired from the firm, his interest having been purchased by Mr. Lambert. Mr. Dexter's retirement from the business was followed by the admission into the firm of George R. Dexter, his son, and of William N. Lambert, a brother of Catholina Lambert. William N. Lambert, who was obliged to visit South America for his health, died there in November, 1869. George A. Dexter retired from the firm in 1875 and died about three years subsequently. H. B. Wilson, of New York, entered the firm in 1878.

In 1880, Charles Barton, after a twenty-five years' pleasant and profitable con-

nection with the firm, withdrew therefrom, thus severing an association between himself and Mr. Lambert which had existed for over a quarter of a century, without even the shadow of a dissension—a notable record of business co-partnership.

The removal of the business from Boston to Paterson was probably owing to the following circumstances: Mr. Lambert had for many years been in the habit of visiting Paterson, sometimes on business connected with the firm's supply, but oftener for the purpose of pleasant intercourse with his friend, the late Robert Hamil, of the firm of Hamil & Booth. Attracted by Paterson and its surroundings, he decided to make it his place of residence, and in 1861, with this view, he purchased his present country residence at South Paterson, then known as the James Close homestead, removing thereto in that year. He has since made Paterson his home. A desire to have the manufactory nearer to New York, and under his personal supervision, the low price of real estate and the advice of Mr. Hamil and other friends, were the considerations which induced Mr. Lambert, in 1866, to purchase a mill site on the East side of Straight street and thereon erect the "Dexter Mill," a three-story brick building 220x50 feet, with detached buildings for engine and dye houses. The removal of the firm's machinery to Paterson was followed by the gradual withdrawal of their stock and closing up of outside stores, and the concentration of their merchandizing in New York.

To describe the various cotton, worsted and silken fabrics manufactured by this firm during the years they have been in business would be impossible. The vagaries of fashion, or the demand of the times, have dictated and controlled their production. For instance, during the early days of the war of the Rebellion, they were largely engaged in the manufacture of military trimmings; in fact there is no article that could be fashioned from cotton, worsted or silk but has at some time or another been made by them. They have manufactured cords, gimps, braids and tassels for every conceivable purpose; all kinds of fancy headgear, hair nets, chignons, false curls; an endless assortment of neckwear; articles for manufacturing telegraph supplies, for the manufacture of artificial flowers, for theatrical costumers' and for printers' use; coach lace and other trimmings for carriage manufacturers; picture and blind cords, gimps, tassels, and other articles used for furniture and house decoration by upholsterers; trimmings for undertakers, tailors, hatters, furriers, milliners, and for dress and cloak makers. They have manufactured chenille, velvet, beaded, braided, embossed, watered, and every current variety of trimming in vogue during the three last decades.

The manufacture of ladies' dress trimmings was for many years a leading branch of the business, but of late it has been neglected and attention given to ribbon weaving, which has grown to be one of the most important departments of the business. But to Mr. Lambert's foresight and sagacity is due one of the most important additions to the business of the house. In 1874 that gentleman, while in England, purchased a plant of power-looms, which were shipped to Paterson and set up in the mill in the space which had been heretofore used as the trimming department. With these looms the firm commenced the weaving of broad fabrics, and from time to time have made additions to the plant until the broad silk weaving equals any department of their business, and since 1874 the weaving of "cut-up" fancies and dress brocades has been their great specialty.

In 1877 the business was enlarged by the purchase of the A. Soleliac & Son's plant of ribbon looms and throwing machinery. These were kept at work in the Dale Mill, their original location, until July, 1879. The Spring of 1879 witnessed another addition, through the purchase of the Sterrett, Ryle & Murphy plant of ribbon looms. December, 1878, found Mr. Lambert engaged in making preparations for the erection of the third and, up to this date, the largest mill, having purchased from the Society a block of land containing about two acres, on the West side of Straight street, bounded by the Erie Railway, Clay, Straight and Taylor streets. He proceeded to erect thereon a handsome structure, the Southern front of which is to be seen on the left of the accompanying engraving. It is 100x75 feet, two stories, with a pressed brick front. The main entrance to the works, the private office, the counting room and the general offices of the establishment are in the Southern portion, which is represented in the view. The building has quadrangular towers at the East and West corners. From its East tower to an opposite tower of the "Dexter Mill," on the Eastern side of Straight street, is thrown above and across the street a bridge of beautiful design, which, while it serves to connect the new and old mills for business purposes, also adds architectural effect to the entire group, and gives character to all. These buildings, with their imposing fronts, their towers, the illuminated clock and beautiful connecting bridge are among the first objects that attract the eye when entering the city from the South by the Erie Railway, and to a stranger they must form one of the most pleasing as well as impressive features of "Industrial Paterson" at first sight. The rear portion of the new building is what would in England be called a "weaving shed," but those unfamiliar with the term should not be misled, for it is an immense one-story structure, with trussed roof, top lights, and no interior partitions, resembling, when empty, a vast mill or a great railway depot. It is, without doubt, the largest room used for manufacturing purposes in the State. In this portion of the building has been placed the soft silk winding machinery, and the various plants of ribbon looms belonging to the concern, including the plants late of Soleliac & Sons and of Sterrett, Ryle & Murphy. This mill was completed and occupied about July 1st, 1879, and the removal and placing therein of the outlying plants of machinery enabled the firm to concentrate their heretofore scattered business under one management. The building, constructed after a design of, and under the personal supervision of Mr. Lambert, has become generally known as the "Lambert Mill," notwithstanding Mr. Lambert's objection to naming buildings, etc., after those who are still in the land of the living.

The business of Dexter, Lambert & Co., in Paterson, has required the employment of about one thousand operatives, and has been the means of disbursing to them not less than \$30,000 per month, and during the many years in which the firm has been engaged in manufacturing there has never been a pay-day in which the money was not ready and waiting for the hands. In business since 1853, the firm has passed through and safely weathered all the financial panics of that and intervening periods. The volume of their business, which was originally \$150,000, has since increased to over \$1,000,000 per annum. The taxes of the concern are equal to one two-hundredth part of the whole assessment of the city of Paterson.

The lack of sufficient machinery to throw enough silk for the requirements of

the firm's business obliged Mr. Lambert to take measures to supply the deficiency. After a careful consideration of the subject he decided upon a new departure, which was to secure a site and erect a mill in some locality where he could obtain ample water power and secure absence of competition for operatives; a place where the advantages of a large industry and the money which it circulated would be appreciated. Hawley, Pa., was selected as possessing the advantages sought for, and here Mr. Lambert purchased a tract of land along the Wallenpaupack river, a stream which divides Wayne and Pike Counties, and which at this point is a series of falls and cascades, marvellously beautiful and well worth a long journey to witness. Other places, presenting less grand and imposing features, are well patronized by tourists, and it is difficult to understand why the falls of the Paupack are not better known and more thoroughly appreciated. The mill since erected upon this stream, owing to its material and its peculiar architecture, in no way detracts from the natural beauty of the falls. On the Wayne County side of the river, upon the rocks at the head of the falls, Mr. Lambert, early in 1880, proceeded to erect his fourth, and largest, silk mill, and only those who have examined the ground can appreciate the gigantic nature of the undertaking. The mill, which is now completed and occupied, is in shape an elongated parallelogram, broken by a square projection in the front centre; its dimensions are 380x44 feet, the centre projection being 80x80 feet. Owing to the uneven or sloping formation of the rock upon which it is erected, it is five stories high at one end and three at the other. Three of the floors run the entire length of the building, unbroken save by the supporting columns. It is built of a species of bluish grey stone, called by the residents blue granite, and is surmounted all around by a battlemented roof. The wheel pit and shaft leading thereto is 100 feet beneath the centre of the mill, and connecting therewith is a tunnel or tail race 65 feet in length, all cut through solid rock. The motive power is a turbine wheel of 400 horse-power capacity. The equipment is a complete plant, and the only one in the country, of Atwood's latest improved throwing machinery which, when fully clothed, will produce four thousand lbs. of thrown silk per week; also looms capable of producing two thousand yards of plain and gros grain dress silks per day.

On Thursday, June 3rd, 1881, Mr. Lambert, accompanied by his wife and daughter and a large number of personal and business friends, visited Hawley and inspected and christened the factory, naming it "Bellemonte Mill." The Nelson Mill, a structure 90x44 feet, three stories in height, was a part of Mr. Lambert's original purchase. It is situated about 200 feet distant from the Bellemonte, and power is communicated to it from the latter by means of an endless wire cable. Both mills are now in active operation, and are valuable auxiliaries to the Paterson establishment. No inconvenience is occasioned through the want of illuminating gas, for the abundance of power at command supplies a cheap and better method of illuminating, in the form of electric lights, of which the firm have twenty-four in use. The water-power owned here by Dexter, Lambert & Co. has been estimated by engineers all the way up into the thousands, and the firm are satisfied, from the experience of the seasons of unprecedented drought, that the natural flow of the stream will, under the most unfavorable circumstances, give at least one thousand

THE NEW YORK STATE MUSEUM



THE NEW YORK STATE MUSEUM

horse-power at any time. The river for miles is a succession of falls and rapids, with innumerable mill sites, which in any other section except one devoted to lumbering and mining, as this has been, would have long since been occupied by thriving industries.

In respect to unique beauty of situation and wild and picturesque surroundings, Bellemonte Mill has no equal, the long, grey, turreted building, with its battlemented roof, resembling, to some extent, some famed castle of Europe. Standing in bold relief on a rocky hillside, with its evergreen background of spruce, pine and hemlock, it commands on one hand a view of the Lackawaxen river and a long reach of the valley through which it flows; while on the other is seen the beautiful Paupack as it goes tumbling and foaming in a series of falls and cascades, thence through the darkling pines until lost to view in passing between the high cliffs of gray rock beyond. Taking into account all the features of this wild natural scenery, it is safe to say that the Bellemonte Mill is favored with surroundings seldom met with in connection with industrial establishments. The success of the enterprise is now assured. Bellemonte Mill is no longer an experiment. The expectations of its projector have been fully realized and the wisdom of its establishment vindicated.

PELGRAM & MEYER.

MILLS AT PATERSON AND BOONTON, N. J.

The silk manufacturing establishment of Pelgram & Meyer ranks with the very first in the country, the product of their looms being known and sought for in every market, it being conceded that in design, quality or finish they are unsurpassed by any other, either domestic or foreign. The extensive business operations of this house during the past decade have added much to the importance of the silk industry in America and contributed largely to the growth and prosperity of Paterson.

Pelgram & Meyer inaugurated this vast industry in 1873, at the old "Industry" Mill, in Ward street, mainly in the department of ribbon manufacture, but they soon advanced to broad silk and Jacquard weaving, and throwing. Both partners being experienced in the business they had undertaken, and shrewd, far-seeing business men as well, the enterprise was prosperous from the very outset, and increasingly so from year to year. Their record illustrates as forcibly as that of any other firm in Paterson what may be accomplished by diligent attention to business, a uniform course of fair and equitable dealing, and the production of a class of goods superior to most that are found in the market, and inferior to none. These are among the factors that have contributed, more than any other, to the remarkable progress of the past few years, as shown by the following record, which, probably, is almost or quite without parallel in the history of any other American textile industry:

Pelgram & Meyer remained as occupants of the "Industry" Mill until 1875, when they purchased the old "Heathcote" Mill, at the corner of Temple and Matlock streets, their present location. This old mill was repaired, renovated, refitted and fully equipped, and the firm continued to prosper, the business steadily ex-

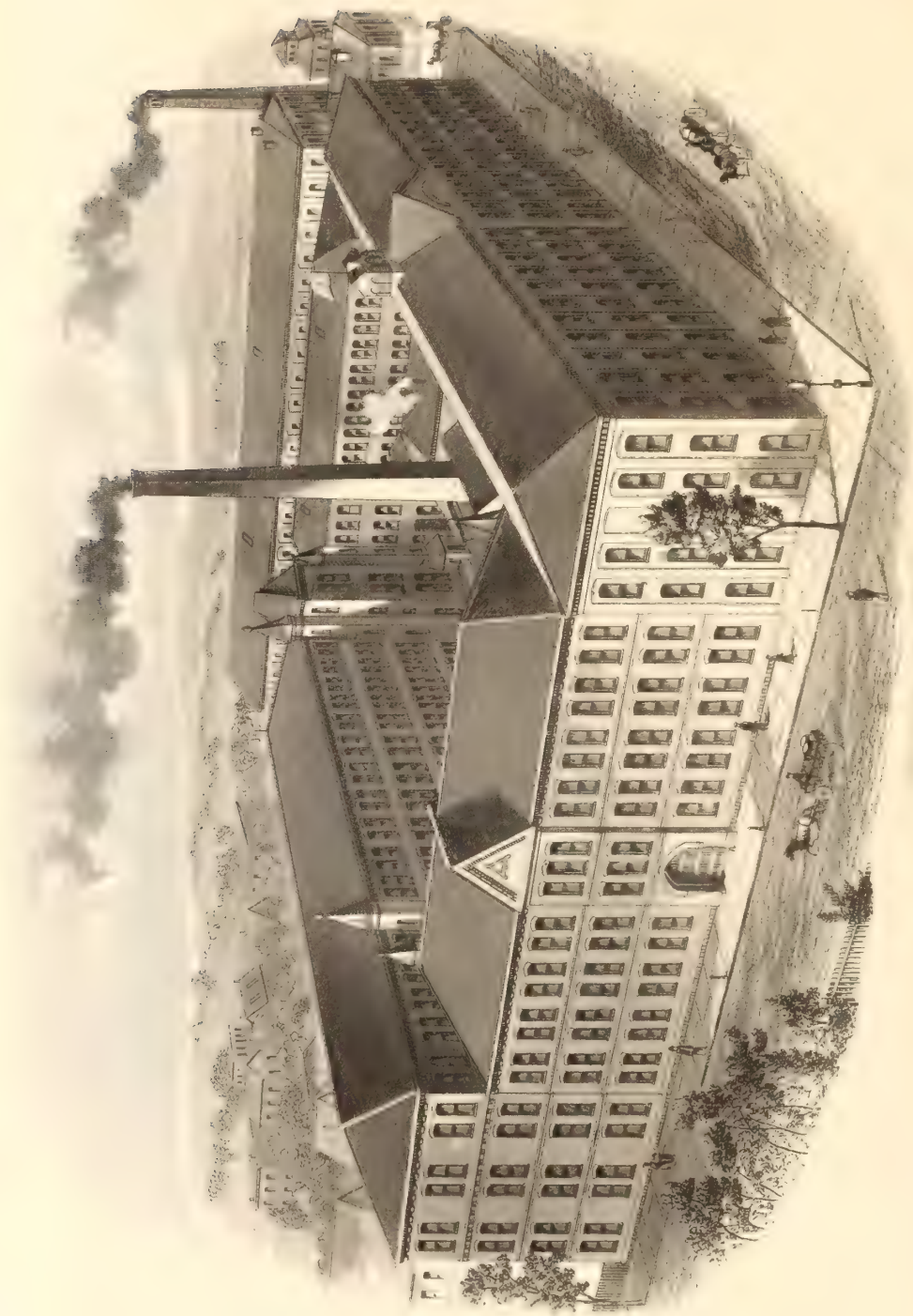
panding so that, during each of the seven years next succeeding, extensive buildings were erected to shelter the thrifty industry.

In 1876 the brick structure on the Matlock street side was added, 160x50 feet in size, four stories; in 1877 the original mill was enlarged and a story added, and new engine and dye-houses were built; in 1878 the new mill, on Temple street, was built, 100x50 feet, four stories; in 1879 the mill on Lane street was added, 100x50 feet, four stories; in 1880, the industry having expanded until it could no longer be profitably confined within the city limits, a large frame mill at Boonton, about sixteen miles distant from Paterson, which had long stood idle, was secured by Messrs. Pelgram and Meyer, who enlarged it to its present size, 180x40 feet, two stories, fitted it up, and equipped it fully with throwing machinery. In 1881 the new brick mill at Boonton was erected, being completed about the close of the year. This mill, located on the bank of the beautiful Rockaway, to which some of its numerous dependencies extend, is admired by all who see it in passing on the Delaware, Lackawanna & Western Railway, which is distant but a few hundred feet. This extensive mass of brick and mortar comprises about half the area of flooring space afforded by the group of buildings in Paterson, on Lane, Matlock and Temple streets, already described.

Taken altogether, the buildings of this firm would present the appearance of a very respectably-sized hamlet—a little textile village. The frontage on Matlock street is 310 feet, on Temple street 100 feet, and on Lane street 100 feet, and the square thus formed is filled with a number of detached buildings devoted to various uses, the total area of flooring space being 110,000 square feet—nearly four acres. Besides this chief group there is a dye-house, built in 1877, 200x50 feet in extent; also a number of other minor structures.

The Boonton works of the firm, as they exist at the close of 1881, consist chiefly of one building, 200x50 feet, four stories; another building, 80x50 feet, one story; a third, 160x50 feet, one story; and a gas works more than adequate to supply the above with light. Total flooring area at the Boonton works, 52,000 square feet; grand total area of flooring occupied in Paterson and Boonton, 162,000 square feet—about *six acres*. Every building, in both city and town, is filled from top to bottom with the latest improved machinery, for use in each department. Included in the equipment are 310 power-looms and 22,000 throwing spindles. There are 1,200 hands employed, to whom are paid in wages \$375,000 per annum. The value of the finished product for 1882 will reach \$1,500,000, and may far exceed that figure when the Boonton "annex" is in full operation. This branch is more especially devoted to spinning and the manufacture of plain gros grain dress goods.

The firm import all their raw material direct from the European and Asiatic markets, and in every transaction make the utmost out of the great advantages secured through the use of ample capital and a large experience in the trade. Every operation in the various processes of manufacture is carried on on their own ground and under their personal supervision, and the goods are sold direct to wholesale and retail dealers, without the agency of "middlemen." This is accomplished through the able management of the salesman at the New York store, 57 and 59 Greene street.



All the dyeing of material, both in black and colors, is done on the premises—another great advantage, and the colors of the fabrics produced are justly celebrated for their superior excellence, none but the best dyes and other drugs being used. The spinning department is especially noted for the exquisite perfection of its product; the finest threads of silk are spun here, equal to anything produced at any other silk factory in this country or in Europe.

Among the chief of the varied productions of this vast industry are plain and figured ribbons, including Jacquard goods of the richest class; also dress goods, plain and brocaded, and other fabrics, all of which have been brought to such a state of rare perfection that they are not excelled by any foreign production whatever. The ribbon product is especially large, and the leading brands of the firm, the "P. & M." monogram and "Metropolis," are recognized as indications of excellence by the trade the country over, so great and widespread is the reputation they have achieved. Seen alongside of the most costly of imported goods, the dress silks of Pelgram & Meyer lose nothing by comparison, and when both are placed together—not an unfrequent occurrence in the marts of trade where both are sold—the domestic fabric is often preferred.

The firm added to their business near the close of 1881 the production of costly velvets and plushes, of a quality so exquisite that it seems reasonable to expect confidently that at a day not far distant the American market will be supplied with this class of goods from American looms, and that they will be equal, if not superior, to anything of foreign manufacture—another textile victory for the "Lyons of America."

WILLIAM STRANGE & CO.

STRANGE AND ARKWRIGHT MILLS.

In the year 1868 the firm of William Strange & Co., which had grown out of the great New York silk importing house of Strange & Brother, who began the manufacture of ribbons in Williamsburgh in 1863, came to Paterson, where the production of ribbons was continued, with a larger plant than any other in the city at that period, ribbons being their great specialty. The firm have now an immense establishment, and rank with the very first among the princely silk manufacturing concerns in Paterson.

The house of Strange & Bro. has been in business uninterruptedly for over forty years, having started in 1838, at the corner of William and Beaver streets New York. The different locations of the firm since that time are worthy of note as marking the movement of the importing trade up-town, the present location of Strange & Bro. being in the new building at the corner of Prince street and Broadway, opposite the Metropolitan Hotel.

The manufacturing firm is composed of William Strange and his father, A. B. Strange. The name of the former appears during a dozen years or more past as one of the most active and aggressive silk manufacturers in connection with every

movement looking toward the advancement of the industry in this country, and especially in Paterson, in reports of the Silk Association, and in other publications devoted to the industry, and he has for years held a high place in the counsels of his associates whenever a danger was to be averted or an advantage gained—as, for instance, in respect to the tariff question.

The manufacture of ribbons in Williamsburgh was started with forty looms. A member of the firm about this time went to England and purchased the entire plant of John Day & Co., at Coventry, at one time a vast and important industry. The company had failed, and soon after the arrival of the plant, the finest and most extensive by far for the manufacture of ribbons in this country, Mr. Day, his family and a large number of the hands formerly employed at the Coventry establishment, including dyers, came over and found employment, mainly with Strange & Co. Afterwards John Day established himself on the top floor of the Murray Mill, manufacturing on his own account. He is still engaged in the business.

In 1863, and for years thereafter, the Stranges were the largest manufacturers of ribbons in this country, and they have maintained a proud position in that especial branch to the present time. They also produce a very superior class of dress silks and other goods.

Much might be written in reference to the difficulties with which the ribbon manufacture has had to contend, and of the signal success achieved. First of all there was the great prejudice in favor of foreign goods. It was held for many years that it was impossible to make as good a ribbon in Paterson as at Lyons. When William Strange first called on a leading New York ribbon house in reference to his product, many years ago, he was promptly told, "It's of no earthly use, Mr. Strange; you are only wasting your time and ours. We buy nothing but the best of goods," the inference being that his firm could not make them. "All right, gentlemen," was the reply; "we shall see in the future." To-day all the best goods in the line of ribbons bought by that house are manufactured in Paterson, at the mill of William Strange & Co., the directions given to their agents on the other side being to place no orders for ribbons there, as they can be purchased here equal in quality, and cheaper.

The facilities at this establishment are so ample and the business kept so well in hand, under the admirable management of Mr. Strange, that all orders are filled very promptly. A large business is done with jobbers East and West, the smaller ones being supplied from the house in New York, while the larger orders are shipped direct from the mills.

The present status is as follows: Plant—looms, 260; spindles, 18,000, a portion of the throwing being done outside; hands employed, 1,000; pay-roll, fortnightly, \$15,000; consumption of raw material, 80,000 lbs. raw silk, and 2,000 lbs. cotton per annum; total value of product, about \$1,000,000 yearly; flooring space, 111,500 square feet; power employed, 190 horse. When first established in Paterson, in 1863, the firm employed about 200 hands and ran 50 ribbon looms. The manufacture is in the care of William Strange, and he has as his efficient assistant Frederick Baer, an experienced and accomplished manufacturer, before alluded to. The character of the firm is uniformly aggressive, and all new improvements of merit



are promptly adopted, and increased facilities added constantly. The extensive buildings occupied, situated on Madison street, are of imposing appearance, ranking with the first in Paterson, and the equipment, which is ample, consists of the best mechanical appliances in every department of the manufacture.

HAMIL & BOOTH.

PASSAIC SILK WORKS, AND HAMIL MILL.

As noted in a foregoing sketch of the establishment in Paterson of pioneer silk manufacturers, Robert Hamil and James Booth entered into copartnership and started in business in 1855. It is the only establishment founded at that early period, or even several years subsequent thereto, that has not only maintained its original name but of which it may also be said that it has been uninterruptedly prosperous from the very outset to the present date. In 1852 James Booth was known as a practical silk worker, occupying the position of superintendent of the finishing department at the Gun Mill, for John Ryle, at a salary of \$6 per week. Robert Hamil, also a thorough and competent workman, was employed in the same mill, as superintendent of the hard silk department, on the fourth floor, at a salary of \$9 per week. The pay books of the mill of that period are still in existence to show this. In later years these gentlemen stood at the head of one of the most important silk manufacturing establishments in Paterson, which means one of the first in the country; the consumption of raw material in their two extensive mills, on Ward street and on Mill street, aggregating upward of 2,500 lbs. per week, a greater amount than was manipulated by all the silk mills in Paterson taken together at any date prior to 1860 or thereabout.

Messrs. Hamil & Booth commenced in a small way in the Beaver Mill, a location that seems to have been fixed upon as a starting point of a great many of the infant silk enterprises of the period. Here they put in \$5,000 worth of machinery and began as throwsters, with twenty operatives. After two years of successful operation they leased two rooms in the Machinists' Association building, afterward occupied by P. & L. Bannigan, and enlarged their business. They remained here until 1858 or 1859, when they rented a portion of the Murray Mill, belonging to John Ryle. Hamil & Booth may be regarded as the first really great rivals with whom the pioneer establishment of Mr. Ryle had to compete. The firm felt their way slowly and cautiously to success, only enlarging their facilities and extending their operations as circumstances strictly warranted. Upon removing to the Murray Mill they again extended their business. For about fifteen years the firm were exclusively throwsters, but from 1868 to 1870 they attempted gros grains and black silks, and though their product was excellent, so perfect that a medal was awarded by the American Institute in 1869, yet the condition of the markets, growing out of the Franco-German war of 1870-71, led them to suspend this branch for the time being.

The firm remained at the Murray Mill until 1832, when they bought the "Passaic Mill," on Ward street, near Railroad avenue. This mill had been built by Fuller Brothers, of New York, jobbers of machine twist, etc., who displayed for their sign a figure of a sailor waving his hat aloft. J. C. Fuller, one of the firm, is described as an inventive and enterprising genius, who was foremost in the building of the mill, which was erected about 1838 for the purpose of manufacturing by a new process a patent loup twist and other novelties. At the time Hamil & Booth succeeded to the occupancy, the mill was in size 40x180 feet, and the new proprietors at once raised it one story and added 80 feet to its width. About 1874 they again extended it, by the addition of an L 75x80 feet in size, and there have been various improvements and minor additions made since, until it now ranks with the first and most extensive silk mills in the city. In 1872 the firm bought the large building on the race, at the Northwest corner of Mill and Market streets, known as the old Godwin Cotton Mill, it having been originally devoted to the cotton manufacture. This is a three-story building with attic, 58x200 feet in size. After the purchase of the Godwin, which was rechristened the "Hamil," Mill, the firm engaged in the manufacture of ribbons and twilled goods. In 1873 they resumed the production of gros grain and black dress silks; in 1874 they added fringe silks, with Jacquard weaving, and the firm are to-day among the largest manufacturers of these goods, also of silk handkerchiefs, scarfs, millinery silks, grenadines and other of the higher class of silk products, in Paterson.

The present status of this important industry may be represented statistically as follows: Plant—silk looms, 400; spindles, 30,000, a portion of the throwing being done outside; hands employed, 1,149; pay roll, fortnightly, \$16,000; consumption of material, 2,500 lbs. of raw silk per week; total value of product, about \$1,500,000 per annum. All the buildings are full from top to bottom of machinery of the best description: every new and valuable improvement is at once adopted and the goods are of superior excellence. Since the demise of Mr. Hamil, September 11th, 1880, Mr. Booth attends to the outside business, the financial feature, at the office in New York, No. 461 Broome street, while Peter M. Bannigan, who represents the Hamil interest, is in full charge of the details of manufacture at the mills, a department which was formerly presided over by Mr. Booth. The remarkable and uniform success of the firm, almost, if not quite, unprecedented in the silk industry in this country, is attributed to a perfect understanding of their business and a rigid attention thereto by the firm, and these conditions remain unchanged. The business is continued under an arrangement whereby the affairs of the concern are to be conducted under the same firm name for the space of five years from the date of Mr. Hamil's death, and longer if mutually agreeable, it being optional with Mr. Booth to purchase the interest of the Hamil heirs, if he shall so desire.

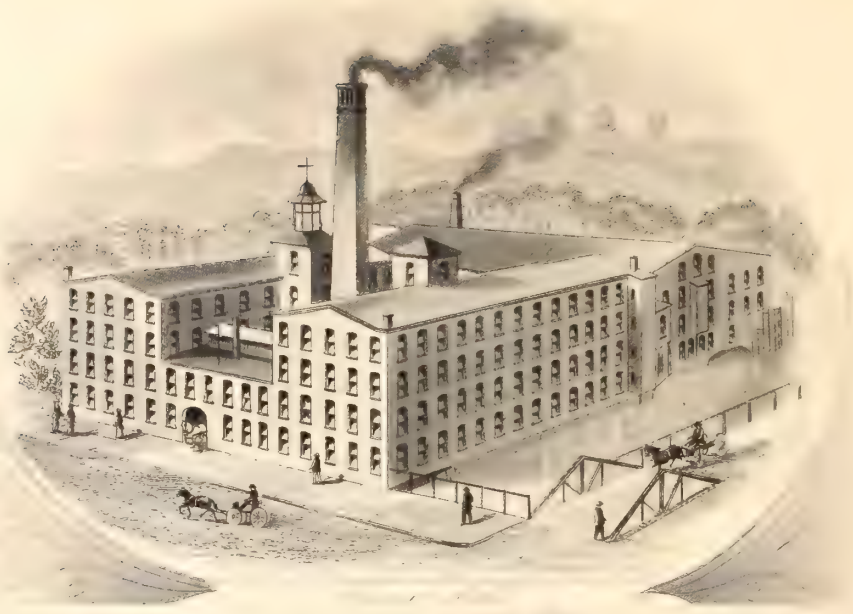
R. & H. ADAMS.

HARMONY, INDUSTRY AND ESSEX MILLS.

In the early days of "Industrial Paterson" Cotton was King, and none disputed



Yours Truly
Robert Sumner



his supremacy; but in these later years Queen Silk is in the ascendant, having to no inconsiderable extent wrested the sceptre from his grasp, and, with dainty and luxurious ways, quite overshadowed the old monarch and in a measure hidden him from view by the ample spread of her rustling and gorgeous draperies. It is a fact noted by political economists that these two textile sovereigns rarely, if ever, dwell in harmony, or achieve anything like an equal importance, when their location is identical and their subjects too closely intermingled. Both are absolute in character and neither is disposed to tolerate a brother, or a sister, near the throne. Conceding this to be true in a general sense, it is a matter of real gratification to find an establishment in which the thrones are closely united, the Montague and Capulet wedded, and, figuratively speaking, the silken and the cotton fibres combined in a single thread. There is probably no such union existing anywhere (not to an extent to warrant a mention) save in the vast establishment which is the subject of this sketch. Taking the department of silk manufacture alone, there are other establishments that are more extensive; but considering the silk and cotton features together, and they are very closely united here, there is probably no more important textile industry in Paterson; none that employs more hands, that occupies more space nor that can show a greater amount of product.

R. & H. Adams boast of an origin dating back to 1829, or more than a half-century ago. In the year named William Adams, the father of the present sole proprietor of this flourishing industry, started to weave mosquito netting in New York city, with one loom. In 1840 a large dry-house was built at No. 28 Perry street, New York. About 1852, the two sons, since so closely identified with Paterson, Henry and Robert Adams, also an older brother, William, completed their education, and Henry, ever active and aggressive, and from his earliest youth possessed of excellent qualifications for business, entered a store in New York, established by his father for the sale of the manufactured product, mosquito nets, crown-linings, buckrams, etc. In 1851 a large finishing-house was built in West Seventeenth street. In 1857 the firm of William Adams & Co was organized, the two sons, Robert and Henry, being the "Company," and the old Harmony Mill, Paterson, belonging to the estate of Duncan McEwen, was bought. This mill had long been occupied as a cotton factory by Mr. McEwen. When the Adams's began here they had a plant of sixteen looms, and about 1,600 spindles. In 1858 a large bleachery, finishing and dye-house were added, and the finishing-house in New York was abandoned, this branch of the manufacture, also, being transferred to Paterson. In 1862 a large extension was built to the Harmony Mill, the product being still the same, mainly mosquito nets. In 1864 the firm of William Adams & Co. dissolved, and that of R. & H. Adams was formed, the father retiring.

In March, 1869, the Harmony Mill burned, and the firm sustained a loss of \$100,000 above the insurance, but a superior structure soon replaced the old mill. In 1871 the Essex Mill, belonging to the Colt estate, was bought and large additions and improvements made. In 1874 a large storehouse was erected on Mill street opposite the Essex Mill. In 1875 the Industry Mill, which had been occupied by H. M. Low as a cotton factory, was purchased, torn down and rebuilt. The same year the bleachery and dye-house burned. In 1876 the new Harmony

Mill was built, in front of the old Harmony, and the silk manufacture was begun. In 1877 the old Harmony Mill was altered, one story being added for the manufacture of broad silk, handkerchiefs, etc., the new mill being devoted mainly to silk throwing and ribbon weaving.

March 4th, 1879, the firm dissolved, Robert retiring and Henry remaining as sole proprietor. The firm name was retained by Henry, by legal right, the question being submitted to the arbitration of a court of law, which decided the case in favor of Henry Adams and adversely to the claim of Robert.

In 1879 the Industry Silk Mill was built, in front of the Industry Cotton Mill, and in December, 1880, an extension to the Harmony Cotton Mill was commenced, 59x98, with an L extending across the Industry lot, 45x68, all four stories throughout, with the intention of adding two stories more in the future, the walls being very substantial and fully equal to even a greater addition in height. New machinery of the very best character was placed in this mill, and several new branches were added, such as the manufacture of silesias, wiggins, cambrics, and other materials used in the milliners' and dressmakers' art. Quite recently the manufacture of bobbinet and tarletan has been added, something quite new to this country. A new boiler-house has been built adjoining the Harmony Mill, between that and the Industry, which is one of the finest in the city devoted to that use; size 25x60. Here four new boilers have been placed, of 100 horse-power each. Two more will be added, making a battery of six boilers in all. March 15th, 1880, ground was broken for a two-story extension to the Industry Mill, 30x128 feet, two stories, which was finished in a few months and is now occupied as a dye-house and bleachery, the firm doing all their own dyeing, in cotton. During 1881 a new engine-house was built and a Corliss engine of 350 horse-power added.

This immense establishment is under the general management of William Adams, son of the proprietor, who, though still a very young man, displays a remarkable aptitude for business. He is a graduate of Columbia College, New York, with high honors. He is especially accomplished in mathematics, and produces the most wonderfully elaborate tables showing in comparative form the cost of production in the different departments of the establishment. Henry Adams, whose natural business talents have been cultivated until he is the peer of any he is likely to encounter in the great marts of trade, gives his personal attention to the New York warerooms, Nos. 83 and 85 Greene street, corner of Spring, where the product of the mills is sold, without the aid of any "middlemen" to share the profits.

The business offices in Paterson are unsurpassed by any in the city, being fitted up in a most thorough manner, and furnished with every convenience, including telephonic connection with all parts of the city and with the New York office; also a fire-alarm signal box, No. LXXI, placed alongside the desk in the principal office, though the excellent and ample facilities for extinguishing a fire in the establishment are so perfect as to render this almost unnecessary.

In the matter of fire-escapes the most admirable arrangements exist, which ensures the safety of the employes almost beyond a doubt, no matter what the emergency. This thoughtful consideration for the safety and comfort of their hands



Henry Adams

is one of the prominent characteristics of this firm, and the most pleasant relations are maintained between employer and employed, since the change which took place in March, 1879. It is not an uncommon thing for the operatives to have their wages advanced without any solicitation, and the uniform attitude of the firm conduces to the general good feeling and to cement the bonds of harmony and identity of interest between Capital and Labor as represented here. The most perfect system is maintained in the vast establishment, and all the operations are conducted as if regulated by clockwork; but there is no unnecessary rigidity introduced, merely to assert a superiority and widen the gulf between employer and employed. The business of mosquito net weaving in this country must acknowledge the elder Adams as its founder, and this establishment, which has grown from such a humble beginning, is the largest in the world. There are several other manufactories of mosquito net in the country, but they are too insignificant to be named in comparison to this.

The machinery in the several departments is of great variety, and probably could not be duplicated in this country. The cotton product alone consists of over fifty different classes of fabric. As now existing, with all the additions in space and machinery recently added, both the silk and cotton manufactures are carried on in all their branches. The establishment is a veritable textile principality within itself. There is even a machine shop perfectly equipped to repair old and build new machinery. There are also carpenters', painters', millwrights' and other departments in which the best of mechanics are to be found, about forty in all, outside of either silk or cotton operatives, constantly employed on new work or in repairing; and when there is a building to erect—and there are usually one or two "on the stocks"—many more workmen are added, the work being all done by the day—no contracts.

Of the processes of manufacture it is unnecessary to write: the manufacture of the great staple, mosquito netting, is quite simple, the loom used being in general construction very like any other loom, except that it is so arranged that the threads are left with a space between, and are not driven closely together, as in cloths. After the weaving the net is washed, dried, starched and ironed, all by machinery, and so cheaply is it produced that it is generally regarded quite as economical to buy a new one as to wash one when soiled. In the dyeing of the product this firm excels all others, producing many more as well as more attractive colors than were known until quite recently, including all shades and hues, both standard and fancy. The product in this line is about 260,000 8-yard pieces per month, or over 3,000,000 per annum, and this is shipped to every country on the habitable globe where it is warm enough for mosquitoes or other insects to exist for the torment of man. Great quantities are shipped to Europe, Asia and Africa, the orders from China and India being very heavy and increasingly so. The yearly product of R. & H. Adams is adequate to the erection of canopies over 1,500,000 beds, and the boon extended to suffering humanity, at the cost of but a few shillings for each net, should entitle the firm to a monument (which might be erected by piling up the myriads of baffled mosquitoes) as a Beneficent Institution.

Following are the statistics of the establishment as existing at the close of 1891:

Area of flooring in the Industry Mill—main building, 39,984 square feet; upper tower, 400 feet; lower tower, 500 feet; picker house, 3,000 feet; machine shop, 2,940; ware-room, 2,450 feet; dye-house, 2,400 feet; can room, 2,400 feet; can room extension, 720 feet; bleach house, 2,700 feet; bleach house tower, 200 feet; total, 59,494 feet. New mill—main building, 15,640 feet; bridge tower, 980 feet; bridge, 234 feet; total, 16,854 feet. Blacksmith shop, 420 feet; surge house, 644 feet. Harmony Mill—main building, 30,000 feet; dry-house, 19,500 feet; front mill, 10,400 feet; front mill extension, 840 feet; front mill extension, engine house, 2,400 feet; storehouse, 18,600 feet; Harmony extension, 36,166 feet. Essex Mill—main building, 40,500 feet; extensions, 37,800 feet; connections, 11,260 feet; total, 89,560 feet. New extension for bleachery and dye-house, 5,680 feet. Grand total, 290,552 square feet. The quantity of cotton consumed averages about 66,000 lbs. weekly, or nearly three million lbs. per annum, value of raw material used per annum about \$400,000. Amount of raw silk material used, 1,600 lbs. fortnightly; 41,600 lbs. per annum; value, about a quarter million dollars, varying of course according to the cost of raw silk. Total value manufactured silk product, about \$450,000. Number of looms on cotton, 1,200; number of spindles, cotton, 56,512; number of looms on silk, 150, divided about equally between ribbons and broad goods.

About 60 dozen handkerchief and 450 12-yard pieces of ribbon are turned out daily. Number of hands employed, in cotton—Essex Mill, 280; Industry, 292; Harmony, 184; total, 756; in silk, 404 hands; carpenters, masons, machinists, etc., 40; new mill, fully equipped, product, silesias, tarletans, bobbinets, cambrics, etc., 400 hands; grand total, 1,600 hands. Amount paid in wages, \$13,500 fortnightly; \$351,000 per annum. Horse-power—Essex Mill, water, 370; Harmony, water, 180; silk mill, steam engine, 45; Industry, water, 180; Harmony and Essex, steam, 350; total, 1,125. A still further enlargement of this monster establishment was in contemplation at the beginning of 1882, and the constantly increasing business not only warrants this but will, it is thought, render it absolutely necessary, orders being received continually much faster than they can be filled. As it at present exists this most important among the industries of Paterson doubtless furnishes food to at least 3,000 of the working class, a matter for pride and congratulation, even if there were no other important results.

BENJAMIN B. TILT.

The year 1860, and the few years subsequent thereto, were signalized by the establishment in Paterson of the most important silk manufacturing concerns that had yet been known, and with but one or two exceptions these remain, though changed perhaps in name, management or ownership, to the present. The men who arrived during that period were of uncommon force and energy, men of brains and pluck and capital, and of broad and comprehensive views, such as are certain to leave their impress behind on whatever enterprise they have taken in hand, as well as on the place they have chosen as the theatre of their operations.



Benjamin B. Gill

The first of these to arrive was Benjamin B. Tilt, who came from New York early in 1860, and took a plant of silk-throwing machinery on the top floor of the Phoenix Mill, then mainly devoted to the cotton manufacture. It would be most unfitting to lightly pass over the career of such a man as Mr. Tilt, who for nearly twenty years was very closely identified with the silk industry in Paterson, and who did much toward adding to its importance. It will amply repay the reader of this work to contemplate the humble beginning of a man to whom, better than to most of those so designated, may be fitly applied the term "self-made." Mr. Tilt came to this country from Coventry, England, when he was in his twenty-eighth year. He had been regularly apprenticed to the silk manufacture and was a practical and skilled workman. He came, as many others did, thinking that America would offer a grand opportunity for a young man who was a capable silk-worker to rise. He went first to Philadelphia, but found little encouragement, the silk business being still in its infancy. He could find no work and so he went to New York. Here he found it much the same, and he wandered about sick and discouraged at finding matters so vastly different from what he had been led to expect. One day he applied for work to a silk manufacturer named McCrary, and was about to receive the same answer as from others, when the man discovered in some way that he was being addressed by the nephew of an old friend and schoolmate. That settled the matter and turned the scale in favor of the applicant, who was at once given work. For some time he supported not only himself but a fellow voyager, named Hall, who had not been so fortunate in securing work. But his ambitious spirit could not rest. Soon he was heard of in Boston, where he entered into partnership with an acquaintance he had made in New York, by the name of Dowell.

Tilt & Dowell commenced the manufacture of silk at first in a very humble way, but the business grew rapidly in extent and importance. After several years of prosperity Mr. Dowell died, and then the firm of B. B. Tilt & Co. was formed, a new partner being admitted. During the existence of the firm as Tilt & Dowell the Mechanics' Association, of Boston, awarded them a silver medal for the excellence of their manufactures, a high honor, as this body was not distributing such tokens except "for cause." The firm of B. B. Tilt & Co. continued until 1847, when it was changed to Tilt & Dexter. In 1849 a store was established in New York whereat to dispose of the products. Afterward, in 1855, Mr. Dexter and others bought out Mr. Tilt's interest and organized the house of Dexter, Lambert & Co., as elsewhere stated. Mr. Tilt, after some years spent in the silk commission business in New York, came to Paterson at the date above mentioned and in time organized the Phoenix Silk Manufacturing Company, which has grown to be one of the most extensive of the many large concerns engaged in the business in Paterson.

It is understood that the silk plant taken, for debt, by Mr. Tilt was not adequate, for the "tradition" is that about at the breaking out of the war he purchased the plant of John Birchenough, in the Beaver Mill. John Birchenough was either the second or third in order of time to engage in the silk industry in Paterson, after John Ryle. The product of B. B. Tilt & Co. was at first gum silks and sewings. The business grew apace, and soon the New York house was given up and Mr. Tilt concentrated all his skill and energy on the silk manufacture, for which he had always a great penchant.

In 1862, upon the attainment of his majority, Mr. Tilt's son Albert was admitted to a partnership, the firm name being B. B. Tilt & Son. Business continued to prosper, and the concern outgrew their limited space and the industry spread to other mills. In 1863-4 there were three mills wholly or in part occupied, the Phoenix, the Beaver and the old Watson. In 1865 the Tilts secured a controlling interest in the Phoenix Manufacturing Company, which had been devoted to the cotton manufacture, and the product was changed from cotton to silk throughout, Mr. Tilt being President of the company. Additions were made to the Phoenix Mill from time to time until there were facilities to not only manufacture everything in the line of silk goods but to build the machinery wherewith to do the work, some of the very best looms and other machinery in use being built on the premises. The year 1877 found the company among the most aggressive of all in their line, and taking a very prominent place both at the Centennial Exposition and afterward at Paris, at the World's Fair. During this time numerous medals were awarded for excellence of product; medals of bronze, silver and gold by the American Institute at different dates; of bronze and silver at Paris; a medal and highest report at the Centennial, besides diplomas innumerable from other bodies.

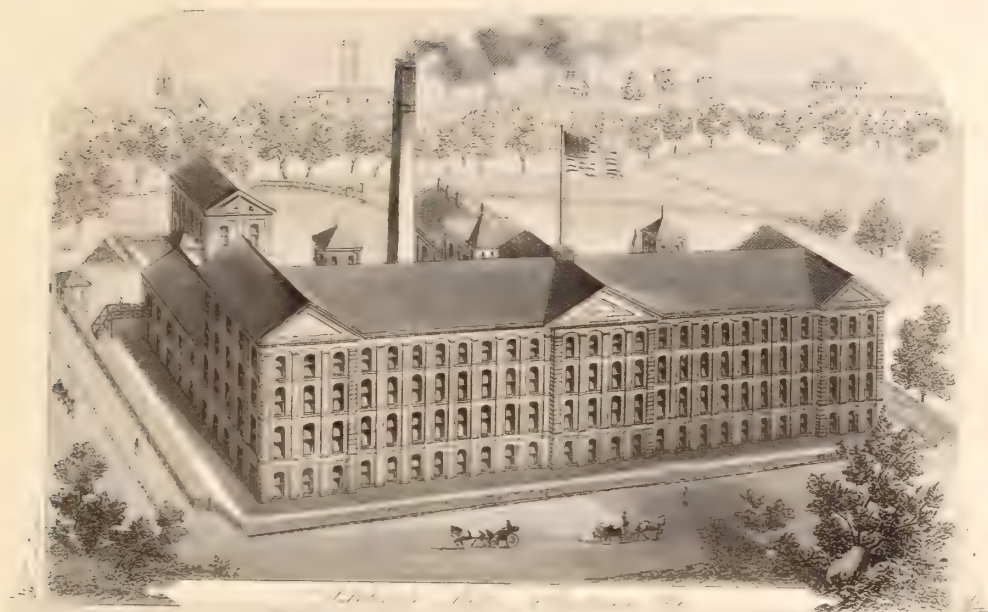
During the pressure on heart and brain of business troubles encountered in 1874, Mr. Tilt, the elder, was quite overcome and suffered a paralytic stroke, and from this time his health steadily declined until his death, September 30th, 1879, at the ripe age of seventy-two years, the business being continued without change, the junior partner having been the real head of the concern for some time prior to his father's death, owing to the growing infirmities of the latter.

Mr. Tilt is remembered with sincere regret by hundreds of those who were his operatives in the past two decades, and who received from him many marks of kindly indulgence and of that paternal care for those in his employ for which he was noted. He was fairly idolized by his people about the mills, his open-handed generosity being quite as remarkable as his cheerful and pleasant familiarity with those who were at all deserving. With men like Benjamin B. Tilt for employers there would be no such element known as antagonism between Labor and Capital.

THE PHOENIX MANUFACTURING COMPANY.

PHOENIX MILL, PATERSON; THE ADELAIDE SILK WORKS, ALLENTOWN, PA.

The firm of B. B. Tilt & Son was for many years regarded as among the more aggressive, both in reference to the adoption of all new and meritorious improvements and also in a readiness to enter the lists in competition with others, domestic or foreign, of any in the field; and the name and product of its successor, the Phoenix Manufacturing Company, is widely known through the splendid exhibits made at the Centennial in 1876, and at Paris in 1878, to the remotest part of this country, as well as to the manufacturers and merchants in every industrial centre and mart of trade throughout Europe. The establishment and rapid advancement of this concern in Paterson, the firm having grown out of the great Boston house of



*View of the Mill and the
 Mill Building of the Worcester Manufacturing Co.*

Tilt & Dexter, has been fully detailed to the date of the demise of the elder Tilt, leaving the son, Albert Tilt, sole proprietor of this great industry.

But at the time when the Centennial was being discussed and arranged for, Benjamin B. Tilt was still alive and full of enthusiasm over the project for a grand display of the silk goods of America. Albert Tilt was one of the committee of the Silk Association of America at the Centennial, and was no less determined that there should be a creditable display. The favorite idea at first was to have a united exhibit, all the silk manufacturers in the country assisting in the effort to show visitors from the great silk manufacturing towns and cities of Europe, in some of which the industry had been prosecuted for hundreds of years, what progress had been made in the new world in this beautiful art. Everything was done by the committee to make this a success; the best space was afforded, also every facility for transportation, etc., but with no avail. The great object sought was to secure a complete plant of silk machinery in operation; and this could easily have been effected, and every detail of the manipulation of silk, from the fibre to the fabric, shown had all united, as they were invited to do. But this was found to be impossible. Some derided the idea as utopian—that Americans should dare to show the product of their looms, and especially their methods of manufacture, to the great silk magnates of Europe; so that the scheme as originally entertained proved a failure, and it only remained to see what individual manufacturers would do.

The elder Mr. Tilt was anxious, and, though warned that it was a foolhardy attempt, it was decided that the company should take suitable machinery and manufacture on the spot, being permitted to sell the product direct from the looms. A book-mark loom of twenty shuttles, a scarf or fancy ribbon loom of ten shuttles, and a broad silk loom for handkerchiefs, besides some minor pieces of machinery, all the product of their own establishment, were taken to Philadelphia and set in motion. There was no other attempt made to run silk machinery at the Centennial, except by J. D. Cutter, of Newark, who operated a hand-loom on dress silks for a short time, and a Philadelphia firm who had a small throwing plant in motion.

The success of the experiment was far beyond the most sanguine expectations; people crowded about the marvellous exhibit, the ignorant gaping with open-mouthed wonder and many of the better instructed with the greatest surprise to learn that such a manufacture was actually being carried on in this country. Multitudes pressed forward to purchase the goods as fast as they came from the looms, and this daring venture proved not only an industrial but also a financial success. In short, the company made much money, even after paying the enormous expenses entailed. Over 300,000 articles were sold during the Exposition; handkerchiefs, scarfs, book-marks, ribbons, etc. The aggregate of sales made was over \$140,000; more than \$50,000 worth was sold in the month of October alone.

The distribution broadcast over the whole country of these beautiful silk products had a very natural effect. People in remote sections got to know more about silk handkerchiefs and other silken fabrics through the Centennial—that is to say, through the exhibit there of the Phoenix Manufacturing Company—than

they would have known in two decades in the ordinary course of industrial progress and such an impetus was given to the silk trade as it never could have received from any other source. This is still being felt, and it is doubtless true that the silk manufacturers of America are deeply indebted to the Messrs. Tilt for the ball they set in motion, which in rolling onward has started thousands of silk looms all over the land.

At the close of the exhibition it was found that the fifteen per cent. commissions on sales by the company had aggregated \$19,100 toward the Centennial fund, the silk exhibit being the third on the list for amount of benefit, the railroad coming first, and the glass-blowing second. When all was closed those having in charge the finances of the Centennial Exposition complimented the Messrs. Tilt highly on their enterprise and congratulated them over their success. A bronze medal for excellence of product and the very highest report were the marks of approval received from the judges.

When, in 1878, the question was broached as to what share American silk manufacturers should take in the great Paris Exposition, the action, or inaction, was nearly the same. Again they hesitated and were timorous, and again they finally decided not to beard the lion in his den by going across the Atlantic to show the silk workers of the old world what we could produce after but a few years' experience and place it side by side to be compared to the goods produced by those engaged in the industry while the native savages still roamed through the mighty solitudes where now the Paterson silk mills are located. There was no united action, which would have resulted in a grand display, and so, as in the Centennial year, the Phoenix Manufacturing Company entered the lists single-handed, transporting their own make of looms to Paris and weaving their beautiful goods before the admiring gaze of Europe and of the world.

There were gathered the greatest silk manufacturers living; men who had, as had their forefathers before them, drawn their first and every subsequent breath in a silken atmosphere; they had known all the intricacies of the art since they were capable of knowing anything, and yet they marvelled to see this machinery from across the ocean doing, as they conceded in many cases, with a noble frankness, everything they could do, and more. The result was eminently satisfactory. The Messrs. Tilt had two looms at Paris; one an eighteen-shuttle narrow-goods loom for weaving book-marks, etc., and another, a broad-silk loom, for handkerchiefs. The company paid all their expenses of transportation, etc., and made money, and before the close of the fair were pressed on all sides to sell their machinery. The broad-goods loom they refused to sell; the book-mark loom they did sell in compliance with the earnest solicitations of an Austrian, who paid 4,000 francs for it, much more than a new one costs, and took it to Vienna. Doubtless the pattern was what was sought. Here, too, the company received as awards for the excellence of their product medals of both silver and bronze, but, above all, was the proud satisfaction of having met the great silk manufacturers of Europe on their own ground and of holding their own, to say the least.

There were several other American exhibitors of silk goods at the Exposition, but none with silk manufacturing machinery in motion. One very remarkable

feature to the European manufacturers, who divide each department of the industry from another, and rarely overstep the bounds, was that not only did this company display a marvellous knowledge of silk manufacturing, but they had also built the looms on which the work was done. To find an establishment carrying on branches so remarkably diverse was to them quite a new revelation.

The Phoenix Manufacturing Company's establishment, included the old John E. Van Winkle machine shop and foundry, held under lease by Mr. Van Winkle until it was burned in 1875, when it all came into the hands of the company, who built up the old Van Winkle shop for silk manufacturing purposes, and removed the machine shop to the lower floor of the old Phoenix Mill, formerly used for a weaving shop, which was then thoroughly equipped with all manner of tools and implements for constructing silk machinery, and for repairing. All the tools necessary to a full equipment were placed in the shop. There were many patterns of the very best description procured from the Van Winkle shop, and Henry Van Winkle, the son of the proprietor of the establishment thus dismantled, became the efficient superintendent of machinery for the new owners. Here the company have the advantage not only of repairing every defect with the least possible delay but also of having duplicate parts to all machines in readiness at any time they may be needed. Skilled artisans are employed in the various departments about the premises, so that all work connected with the industry is done mainly within the establishment. The plant, area of floor space and general statistics of the establishment are as follows: number of looms, 500; area of flooring surface, 130,000 square feet; number of hands employed, 800; payroll, \$10,000 fortnightly or \$250,000 per annum; total amount of raw material used, 3,000 pounds weekly; total value of manufactured product, about \$1,450,000 per annum; motive power, one turbine water wheel of 140 horse-power, and two 60 horse-power steam engines; total 260 horse-power. During 1881 the front portion of the premises was entirely remodeled and a new structure erected, corresponding with the "elder Phoenix" in the rear. This forms an imposing and substantial brick building, a portion two and another portion three stories in height, the Western end being elegantly fitted up and occupied as offices, and the whole addition affording greatly increased facilities.

Albert Tilt, who is no less eminent for his social qualities than for his tact and sagacity in business transactions, is the President of the Phoenix Manufacturing Company and head and front of all the vast operations conducted by it both at Paterson, at Allentown, Pa., and also in the great marts of trade. In Samuel Thorp, his efficient Superintendent and manager at Paterson, Mr. Tilt finds an invaluable aid, as did his father, Benjamin B. Tilt, in the elder Mr. Thorp, long since deceased, who was for many years the late Mr. Tilt's "right-hand man."

THE ADELAIDE SILK WORKS,

at Allentown, Pa., an "annex" to the Phoenix Mill in Paterson, is occupied mainly, though not exclusively, for throwing the yarns woven at the parent establishment. Plain weaving, also, will be carried on here, fifty looms being placed early in 1882 already on the upper floor, and during the year the number will probably be increased to nearly or quite 200.

The history of this enterprise is unique. It is valuable to other towns which, like Allentown, have depended largely upon a single branch of manufacturing industry. The idea of building a mill was conceived in the Allentown Board of Trade sometime in 1880, a committee of the most prominent and enterprising citizens took it in hand and promoted its success. These were Col. T. H. Good, ex-Mayor; Col. Hiram H. Fisher, one of the largest iron manufacturers in the Lehigh Valley; Major E. G. Martin; Captain M. L. Kauffman, a young lawyer of large fortune and great public spirit; C. W. Cooper, Cashier of the Allentown National Bank; D. O. Taylor, President of the Coplay Cement Company, and A. G. Reninger and Henry Stellwagen, leading merchants. These gentlemen subscribed largely of their own means and induced their neighbors to do likewise. When money enough had been assured to put up the building the committee made a proposition to the Phoenix Manufacturing Company to occupy it. Allentown proposed to build the mill and give the company a ten years' lease, with the privilege of buying the building at any time within that period at cost. The proposition was accepted. The building cost \$85,000 and the company equipped it with \$150,000 worth of machinery.

The following more detailed description of this splendid structure appeared in *The Notions and Fancy Goods Record and Silk Reporter* soon after the dedication and formal opening of the mill, November 17th, 1881.

"The Adelaide Silk Works are admirably situated, and the building is a model in an architectural and business sense, being one of the largest and finest in the country, as well as thoroughly adapted for its purpose. It has a frontage of 257 feet and a depth of 50 feet. There are wings for the offices, vaults, carpenter shop, engine and boiler house, also elevator and stair towers, thus leaving the main building free and open for the machinery. The building is of brick, four stories high, with a smoke-stack 120 feet high. A steam elevator runs the entire height of the building. Gas is used for illumination. The water supply is abundant. The Jordan Meadow Extension of the Lehigh Valley Railroad runs to the West wall of the building, and the receiving and shipping of goods is attended with the greatest ease. There is also a smaller building used as a dining and reception room for the operatives. At present the establishment will be used only for 'throwing' the silk; the weaving will be conducted at the home establishment in Paterson. The first three floors are filled with machinery for 'throwing' the threads; the fourth is at present unoccupied, but it is intended to be used as a weaving room, and it is expected to begin operations on plain dress silks and ribbons next year. The works were opened September 19th with twelve hands; there are now 250 employed. As many as 800 operatives can be accommodated. The majority of the help are girls and boys. With the exception of several old hands brought from Paterson as overseers all the operatives are natives of Allentown, and in two months have shown a remarkable aptitude for the work. Allentown has about 20,000 inhabitants, the majority of whom are what are known as 'Pennsylvania Dutch,' but they are of a very superior class. The machinery in the works, which is made with the latest improvements, is driven by a double-acting engine of 250 horse-power.

"Besides the building and shafting, the people of Allentown furnished motive power, steam and gas fixtures and thoroughly equipped the mill in all its departments with fire-proof vaults and combination locks for storing raw material. A building, apart from the mill, measuring 40 by 30 feet, two stories high, is heated by steam and fitted with all appliances for the convenience of the employes in preparing their meals, washing, etc., one floor of this building is for the use of the boys

and the other for the girls. No one is allowed in the mill except during working hours, but this building is kept open for the convenience of the employes during the dinner hour and when the mill is closed; the rooms are supplied with a library, and are intended to be used also for purposes of recreation after business is closed for the day. The mill was designed and its construction superintended by A. Derrom, Jr., & Co., architects, of Paterson, and was built by Thomas W. Snyder, the contractor, of Allentown. James Beggs & Co. contributed toward the grand result in their capacity of civil engineers. The Superintendent of the mill is Louis Soleliac, whose experience in the silk trade well qualifies him for the post.

"The dedication of the "Adelaide Silk Works," so named after the accomplished wife of Albert Tilt, the President of the company, was a very notable event. A special train of palace coaches left Jersey City in the morning of the day fixed, to convey the many distinguished guests from Paterson, New York and elsewhere, each of whom had received a silken invitation woven at the Phoenix Mill in Paterson. These invitations were on heavy white silk with fluted fringed edges, the inscription being woven in exquisite colors after a beautiful design and the monogram "P. M. C." and the arms of the respective States of New Jersey and Pennsylvania, appearing above on either corner. It was the most beautiful and perfect specimen of fancy silk ribbon weaving that has ever been seen in this country, and will be treasured up as a work of textile art by many who have received it, for years after the occasion for which it was woven has faded from recollection.

"It was a great day for Allentown, and the many distinguished manufacturers and others who were drawn together were entertained in a most princely manner by President Tilt. There was a banquet, followed by speeches and sentiment; in the afternoon a thorough inspection of the mill and surroundings; in the evening there was a grand ball. It was probably the greatest "industrio-social" reunion of the silk trade ever held in the country. Among the prominent men who participated were the following:

"John N. Stearns, of John N. Stearns & Co.; Rev. Dr. Burchard; Charles M. Cornish; D. O'Donoghue, of D. O'Donoghue & Co., raw silk importers; Emil and Bernhard Greeff and Philip E. Gallagher, of Greeff & Co.; G. H. Barritt, of the China and Japan Trading Co.; J. T. Walker; F. Frazer, of F. Frazer & Co., and Rowland Johnson, all of New York city; Albert Tilt, President of the Phoenix Manufacturing Company; John Ryle, President of the Pioneer Silk Company; James Booth, of Hamil & Booth; C. Lambert, of Dexter, Lambert & Co.; Stephen Van Winkle, of J. H. Booth & Co.; George Morlot, J. P. Mackay, Hon. G. A. Hobart, President of the State Senate of New Jersey; E. T. Bell, H. V. Butler, Mayor Gillmor and ex-Mayors Buckley and Tuttle, Hon. J. W. Griggs, John J. Brown, President of the First National Bank; John Cooke, President of the Danforth Locomotive Works, of Paterson; W. C. Wyckoff, Secretary of the American Silk Association; John Lucas, of Philadelphia; Mrs. Lucas, President of the Women's Silk Culture Association, and Congressman Mitchell, of Pennsylvania; also various representatives of the press and many others."

Allentown is full of young women and girls, the daughters of men who work in the iron furnaces and rolling mills, who want to work, but for whom there has hitherto been no opening, except in a few shoe factories and hosiery mills. The silk factory now gives these girls employment, the full complement being not less than 1,000 hands. Between 35,000 and 40,000 spindles are run in throwing yarn to be woven at the Phoenix Mill, with whose product it is merged, and the value given is the total before named, \$1,450,000. The number of hands employed at the beginning of 1882 was about 600, and to these nearly \$4,000 is disbursed fortnightly in wages. Before the year closes the number of hands will be increased to 800 or

1,000, the full complement. The 250 horse-power engine referred to in the *Record* and *Reporter*, as above quoted, is a "Buckeye" attached to a battery of three boilers of 80 horse-power each.

THE LOUIS FRANKE SILK MILL.

was built during the year 1880 and finished about January, 1881. It is a model industrial structure, three stories in height, the main floors being each 50x200 feet in extent, with a wing at each end of about 30x30 feet, besides the engine and boiler houses, which are separate from the main building.

The mill is filled with the best machinery, mostly of the Danforth Locomotive and Machine Company's make, employs over three hundred hands, and has a capacity of 3,500 to 4,000 lbs. of finished product per week. The buildings are almost fire-proof, having solid wooden floors that are six and a quarter inches in thickness in three layers of planks crossing each other diagonally and resting on heavy girders.

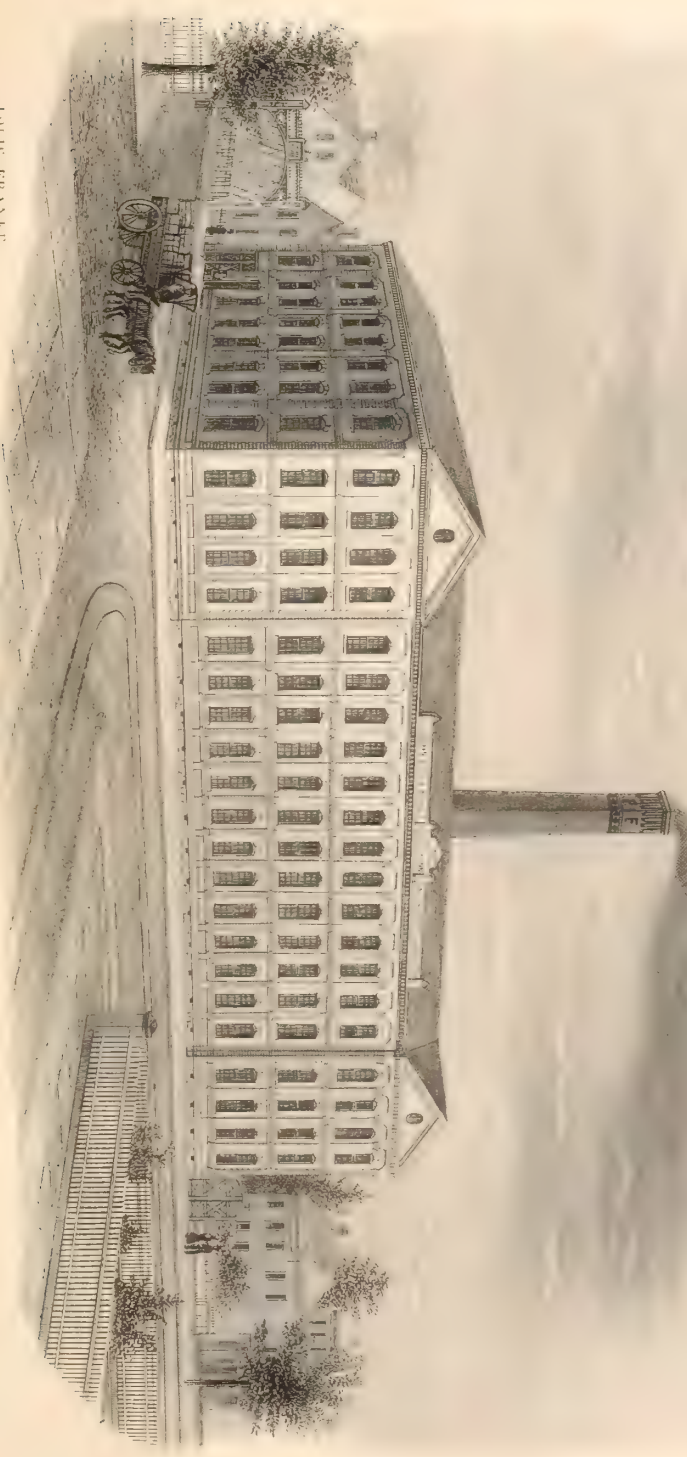
The mill is warmed and ventilated by the introduction of the most approved mechanical appliances, insuring a pure and healthful air at all seasons. During the Summer fresh air and during the Winter air that has been heated in a large chamber over the engine-room is forced by means of a powerful blower through a system of flues and tubes to every part of the large establishment; at the same time any accumulation of foul air and all offensive smells are drawn out by another system of flues, and thus the air is completely changed in the rooms in the course of about every forty-four minutes. The mill is lighted by gas, all the jets on each floor being lighted instantaneously by means of electricity, all risk through the use of matches and other means of lighting being avoided. The light is made brilliant and well distributed by the use of perfectly effective reflectors. The motive power is derived from a 150 horse-power Corliss engine, two Babcock & Wilcox patent safety boilers supplying the steam. The auxiliary engine, pumps and tanks, and arrangements in case of fire, are all of the most approved kind.

Louis Franke, the senior partner, has been an indirect patron of Paterson since 1862, when he commenced manufacturing dress and cloak trimmings and passementerie, in New York, at the corner of Broome street and Broadway, and using large quantities of thrown silk in the manufacture of these articles. Starting with one loft, his business rapidly increased until it occupied eight lofts in the two buildings, at Broome street and Broadway, besides three lofts in Greene street, for making silk braided cords and braids.

In January, 1873, Henry W. Struss, who had been in the employ of Mr. Franke in various capacities, was received as partner, the firm name continuing as before, "Louis Franke," which name was already widely known and continued to be known as that of one of the foremost manufacturers of trimmings in this country. During the year 1875 the firm had difficulty in obtaining an adequate supply of thrown silk, and therefore decided to throw their own silk, and for this purpose hired the then newly-built mill belonging to Samuel Pope, on Water street, Paterson, which they

LOUIS FRANK
HENRY W. SIMONS

LOUIS TRAPPE
S. H. F. W. S. & CO. NEW YORK
THE NEW YORK FAIR - N. Y.



occupied in December, 1875, filling one floor with throwing machinery and also placing there the braiding machinery, from New York. Besides supplying their own wants they also furnished others in the trimming trade, and the business increased so rapidly that, though the whole mill was filled with machinery, the company were still compelled to have silk thrown by other throwsters of Paterson. They therefore decided to secure sufficient room by building a mill of their own, and purchased the plot of ground at the corner of Bridge and River streets, and erected thereon the handsome and convenient buildings above described, and which are an ornament to this portion of the city.

GRIMSHAW BROTHERS.

This firm is composed of three brothers, John, George, Jr., and David H., natives of Macclesfield, England, celebrated the world over for its silk productions. The brothers came to this country with the entire family of ten persons several years ago, during the great depression that fell upon the silk industry as a consequence of the ruinous French treaty of 1860, known as the "Cobden treaty," which admitted the products of French looms into England duty free. This gave the death blow to several branches of the English silk manufacture and reduced the silk weavers of Macclesfield, Manchester and other silk industrial centres to beggary by the thousand.

Whole blocks of buildings were left tenantless and mouldered to decay. In hundreds of instances houses were let to tenants rent free, with the object simply of their better preservation. It was while the old town was in this deplorable condition, a large portion of the inhabitants being fed daily at the public soup-houses, the silk mills closed, with costly machinery rusting in disuse and a dismal future in prospect, that many who have since become notable Paterson manufacturers left the once thriving town and their native country behind and crossed the Atlantic in search of a place promising a reasonable compensation for their labor through the beneficent operations of a protective tariff on foreign silk products. But first of all, before taking this step, strong appeals were made to the government of England in behalf of the languishing silk trade, asking that, in common justice, the home manufacturers might be placed on an equality in the market with their rivals across the Channel. But these appeals were made in vain; hence the hegira that occurred in the years succeeding the adoption of this most unwise measure, a movement by which Paterson has profited to an immeasurable degree.

The brothers Grimshaw, all practical silk workers, started soon after their arrival in Paterson, in Pearl street, in a very small way, running but four or five looms; later they occupied a portion of the Arkwright Mill, where the business gradually but steadily expanded. About 1879 they purchased the splendid property which was known as the Greppo Mill, on very favorable terms as to price, and from that date have made numberless additions and improvements in premises, plant, power and operative force. The location is at the corner of Slater street and

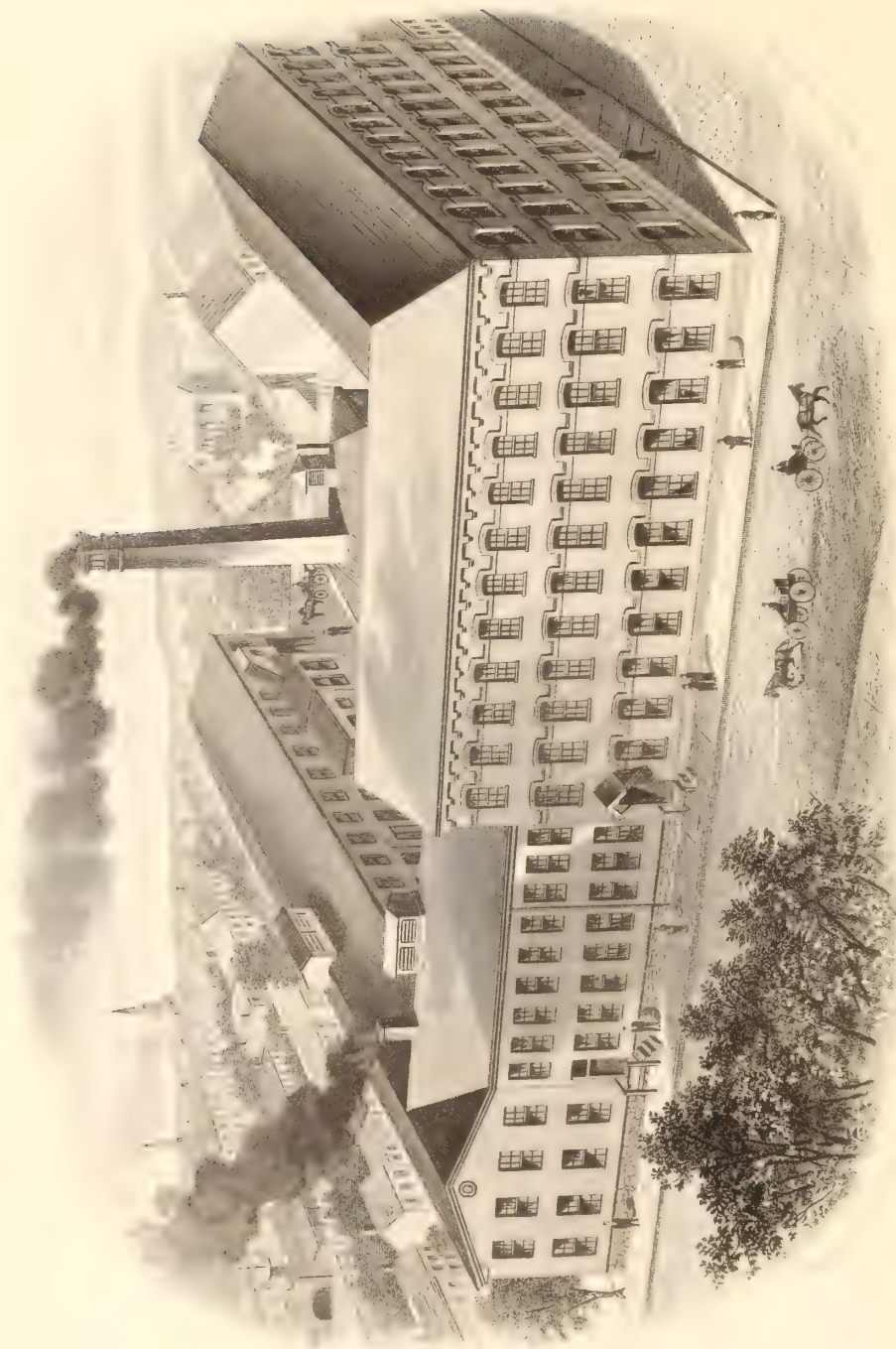
Dale avenue. The firm own an additional frontage of 500 feet on Dale avenue by 100 feet on Slater street, on which they contemplate building largely in the near future. Their premises extend from Slater all the way to Green street. The extensive works, as they at present exist, comprise a building 100x50 feet, three stories, on Dale avenue; another, 200x50 feet, three stories, on Slater street; a dye-house, 100x50 feet, one story, on Prince street; and another dye-house 100x50 feet, one story, extending Eastward from the last-named to the Northern end of the first-named building, on Dale avenue, thus completing a hollow square in which enclosure are a machine shop, boiler and engine houses and other detached dependencies.

The number of hands employed in this extensive establishment is 700; number of pounds of thrown silk produced weekly, 1,400, besides which a considerable quantity is supplied to the firm by outside throwsters; total value of finished production, \$1,000,000 per annum; number of looms running, 300, all with Jacquard attachments. The product is of great range, comprising all the leading novelties in damasse and fancy silks, tie silks for ladies' and gentlemen's wear, linings, etc. Their handkerchief production is immense, including every conceivable design, color and shade of color. In this department the brothers Grimshaw claim to be pioneers in developing a taste for a finer and more elegant class of goods, and the handkerchiefs from their looms early attained, and have since held, a high reputation in the market. The Grimshaw handkerchief has become as familiar as a household word, and if it is not "in everybody's mouth" it is at least on everybody's face. Next in importance to handkerchiefs, the largest production of this firm hitherto has been dress silks and grenadines, the latter both for ladies' and gentlemen's wear, in blacks, colors, checks and fancy patterns. Their figured silks, which are made in great diversity of patterns and coloring, from the self-colored satin damasse to very fancy and costly goods in plain and Jardiniere stripes, have attained an excellence which renders them indistinguishable from the productions of the best foreign looms. The firm have also become famous for their production of silk plushes, for millinery and kindred uses, and a finer grade of this class of goods, in excellent imitation of sealskin, is attracting more and more attention and promises to supersede the foreign article, long thought unapproachable, in the not distant future.

But the irrepressible energy and well-directed skill of this comparatively young firm refuses to be confined even within the ample limits outlined in the foregoing; they seek "other worlds to conquer." The production of silk velvets in this country has been regarded by foreigners as a department of the silk industry not likely soon to be invaded by our home manufacturers, even though abundant proof of their temerity and genius has already been given. In this branch at least the European manufacturers hoped to retain their hitherto monopoly. The successful production of fine velvets involves as requisites the most accurate judgment in the selection of material, the use of machinery very intricate in character, and also more delicate in adjustment than for any other silk product, and withal—and this is indispensable—a superior class of skilled operatives. An essay of this nature, for the production of a domestic silk velvet, which was made about 1866, has been



SILK MILLS OF GRIMSHAW BROTHERS,
PATERSON, N. J.



described in a foregoing chapter of this work; also its disastrous termination. For generations these goods have been produced only by a comparatively few manufacturers abroad, at Lyons, France, and elsewhere, but the success of the Grimshaws in their experimental operations have encouraged others to enter the field, and the year 1881 closed with every prospect of success for this daring enterprise. They are manufacturing velvets of the finest quality and most exquisite finish, using machinery in their production that is pronounced as perfect and effective as any in the world. The ample means of the firm, and their experience of many years in the business, are factors which, brought to bear in the purchase of materials and in manufacturing, give abundant promise that their new ventures in the department of textile art-industry will be as successful, and perhaps more so, than even those of the past.

UNION SILK WORKS.

In 1865, which year was marked by the entrance into the field of several silk manufacturers who have since become very prominent in the industry, Dunlop & Malcolm built the Union Silk Works, at the corner of Straight and Morton streets, and began the manufacturing of sewings, machine twist, etc. The firm maintained a prosperous existence, the business growing steadily and healthfully, until in 1873 the death of Mr. Malcolm terminated the partnership; since that date the surviving partner, John Dunlop, has continued the business alone, a most satisfactory measure of prosperity attending his management, though there have been times of depression, as in 1873-4.

The product is of the same general character as in the beginning, and consists of sewings, embroideries, machine twist, tram and organzine, all of which are classed with the best goods in the market and always command a ready sale. The proprietor of the Union Silk Works is eminently conservative, and being a painstaking manufacturer, with an experience that is invaluable, and not "making haste to be rich," the result is a class of goods that are uniform and reliable. The capacity of the works is 40,000 to 50,000 lbs. of silk annually. The number of hands employed is 120; amount disbursed fortnightly in wages, \$1,400. Every pound of raw silk used is purchased for cash, and the firm, having the money to pay at once, have the whole market to select from, the natural result being that the most excellent material is secured and enters into the product.

The extent of the premises occupied may be represented as follows: Old mill, 150x40 feet, two stories, on Straight street, and 100x40 feet, two stories, on Morton street; new mill, built in 1879, 200x40 feet, three stories, on Morton street; 200x40 feet, three stories, on Madison street. The new mill is a very substantial structure, thoroughly equipped in every detail, and nothing is lacking to render it one of the first mills in the city, especially adapted to the silk manufacture.

The motor in use at this model industrial establishment is a Green patent cut-off engine of 80 horse-power, from Providence, R. I., regarded by Mr. Dunlop as one of the best engines in the country—*ne plus ultra*. Everything about the exten-

sive works is on the same scale of excellence, every item of the large plant being the best of its kind, carefully chosen as the most effective mechanism known to perform the work required. Every foot of ground owned by the firm is occupied by buildings devoted to the business in hand.

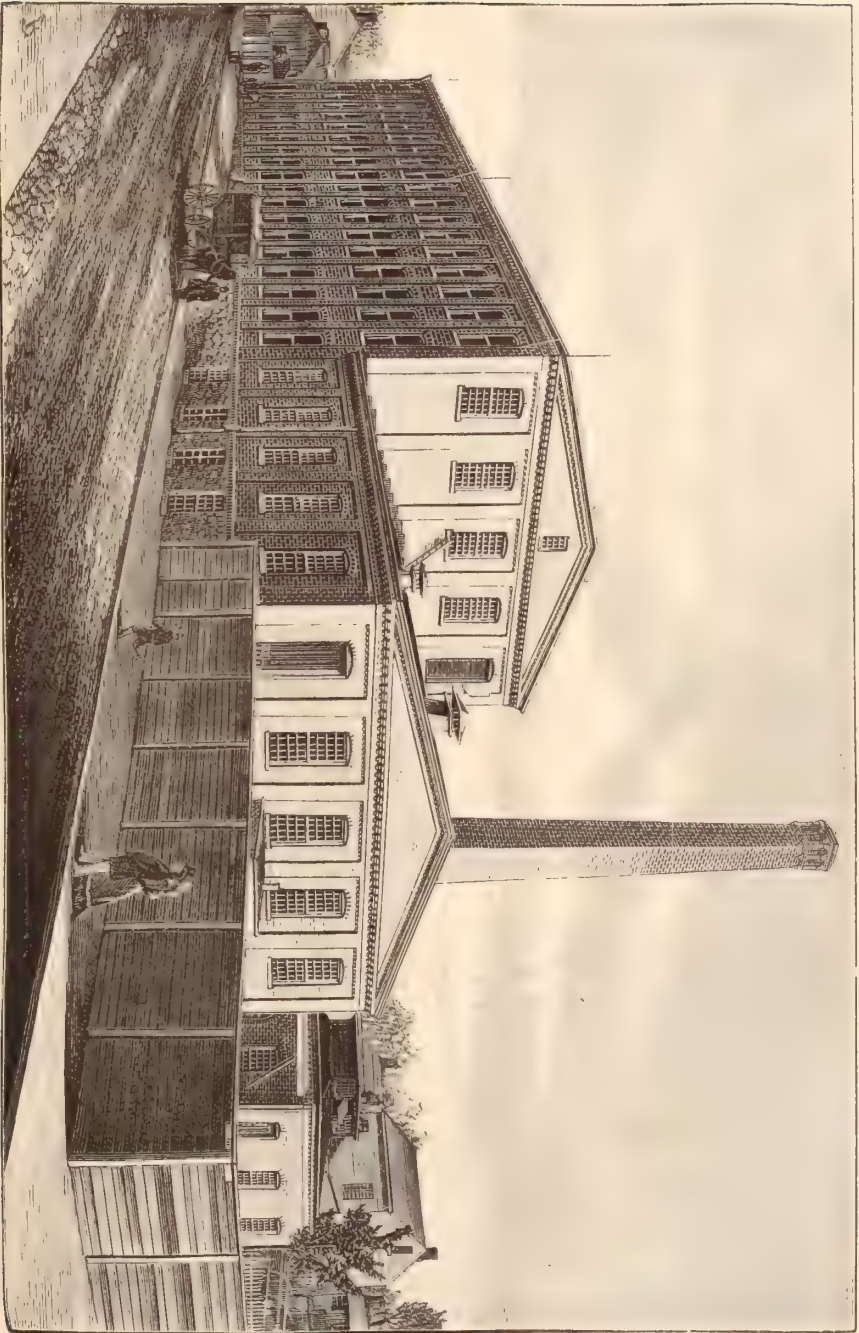
DOHERTY & WADSWORTH.

ARKWRIGHT MILL.

This enterprising silk firm, whose location is at the Arkwright Mill, have been established since October 20th, 1879, and their success may be regarded as well nigh phenomenal. Not many firms of the same age have attained a like prominence or established so enviable a reputation for superior excellence of product. The partners, Henry Doherty, formerly a foreman at the silk mill of J. P. Mackay, and Henry Wadsworth, who held a like position with Grimshaw Brothers, though young, are both practical, experienced and full of that "go-aheadativeness" that in this country is almost certain to command success.

At the commencement the firm had but eight looms, and other machinery in proportion; six months later they were running thirty looms and employing from forty to fifty hands; in the Autumn of 1881 they had fifty-one hand and eighty power-looms, with all the proportionate machinery, and were employing about 150 hands, and before the close of the year had largely increased both their force and equipment, which will be further increased during 1882. The product in 1881 aggregated nearly a half-million dollars in value. The machinery in use combines all of the latest and best improvements in construction, and the establishment is supplied with every facility for the production of the very finest class of work. The mill is illuminated by the Fuller electrical light. The firm has the reputation of producing goods of surpassing excellence and beauty, equal, if not superior, to any imported. It is their aim to bring out the earliest and most elegant attractions of the several seasons, their specialties being the finer qualities of dress and millinery silks, and whatever current fancy goods the prevalent demands of Dame Fashion may require. Doherty & Wadsworth never allow a poor piece of goods to leave their factory; all that care and experience can do is done to perfect their product, which, at the proper seasons, consists largely in novelties and some of the finer grades of handkerchiefs on orders.

There is never any difficulty about selling the goods from this mill, the entire production at times being sold three months ahead of the looms. The appearance of each room in the spacious mill occupied indicates an excellent system pervading the entire establishment, neatness and order characterizing every department, and a close attention to all the details of the business being a noticeable feature. Many of the goods produced are of rare beauty and excellence; veritable poems in silk, reflecting infinite credit on American taste and skill in textile art.



ARKWRIGHT SILK MILLS,
DOHERTY & WADSWORTH, PATERSON, N. J.

ROBERT ADAMS & CO.

HAMILTON MILL.

Robert Adams was up to 1879 the senior partner in the firm of R. & H. Adams, an account of which is elsewhere given. Soon after retiring from the firm above-named Robert Adams established himself in a large cotton manufacturing business at Birmingham, Conn., the principal products being mosquito nets, bonnet linings, and kindred fabrics. This industry has been prosecuted with the energy and aggressiveness which are prominent characteristics of its founder, until its expansion has compelled the admiration of even the wide-awake Yankees of the "Nutmeg State," who are not easily impressed nor readily outdone in daring business operations. The local and State papers in Connecticut have given detailed descriptions from time to time, as the enterprise developed, of the great Adams' industry, the man and his work furnishing a fruitful topic, of which they never tire. The Birmingham establishment, including both mills and machinery, is owned by Robert Adams, personally.

Soon after the beginning of 1881, Robert Adams and James Hunter, under the firm name of Robert Adams & Co., purchased the valuable property on the race-way, off Mill street, at the corner of Passaic street, Paterson, formerly known as the "Hamilton," or "Bachmann," Mill. The mill on this site, which was occupied by Bachmann Brothers for the manufacture of shawls and other woolen fabrics, was burned and, after lying in ruins for a year or two, was rebuilt in 1879. The new Hamilton Mill, as re-built, was in size 40x76 feet, four stories in height, and to this large additions have been made by the new owners, Robert Adams & Co. In fact the original structure was but the nucleus of the vast establishment as completed. The group as it now appears is in the form of a letter H, the building which replaced the original mill forming one side of the letter and the new portion the other side and the connecting link between the two. The main portion of the later erections is 46x96 feet in size, and the connecting arm 44x46 feet, all being four stories in height, all brick, with another, or fifth story, still further skyward, this latter having a "lantern roof," and being enclosed almost wholly by glazed sashes, insuring perfect light and ventilation at will. The peculiar style and character of the buildings, their height and their elevation above the street, render them one of the most imposing group of factory structures in Paterson. Besides the main buildings referred to, there are a number of minor dependencies. On the Passaic street side there is a brick boiler house, 18x30 feet, and a powerful engine has been added to the excellent water-power, to insure the uniform operation of the mill in dry and wet seasons alike. The roofs of all the buildings are slated, and the best modern improvements and appliances for the safety of employes and facilities for successful operation are incorporated in the mill.

The entire establishment is occupied in the manipulation of silk; all the processes of throwing and weaving being carried on under the one roof. There are about 500 hands employed.

The designs for the new buildings are entirely original, and are the work of the

senior member of the firm, Mr. Adams, who gave his personal attention to every detail. J. W. Bailey, who himself is well known as the architect of a number of the finest silk mills in the city, was employed to furnish figures as to material, etc. The firm of Robert Adams & Co. sell the goods of both the Paterson and the Birmingham establishments at No. 10 Greene street, New York, the general office and depot.

WILLIAM H. HANKIN, JR., & CO.

WASHINGTON MARKET BUILDING.

This thrifty and enterprising young firm, who commenced business November 8th, 1880, at their present location, at the corner of Washington and Fair streets, where they succeeded John Lockett, have been most signally successful, illustrating what may be done in the field of silk manufacture when the business is undertaken by men of brains, industry and perseverance.

At first the members of the firm were William H. Hankin, Charles Cordon and James Boardman, the two latter being "graduates" of the Phoenix Mill. The start was made with but twelve hand-loom. In the Spring of 1881 Charles Cordon retired, Messrs. Hankins and Boardman purchasing his interest, and remaining.

The industry has grown until the plant now includes more than twenty hand-loom and thirty power-loom, with all the other requisite machinery, which is a growth to four times the original equipment in a little more than twelve months. This is a very remarkable progress and prophetic of a still more successful future. About sixty hands are employed and the number will be considerably increased within the year. The product consists in part of silk plushes, velvets, tie silks, and dress goods, including grenadines, handkerchiefs, scarfs, etc., some of the fabrics being of exquisite finish and original in design. The satin brocades of the firm are especially noteworthy and are much sought for in the market.

BARNES & PEEL.

GRANITE MILL.

David A. Barnes began the manufacture of silk and mohair braids and the throwing of tram and organzine in the old Beaver Mill, at the foot of Broadway, in 1874. The business at first was mainly throwing, but after a time looms were added to the plant and weaving was begun, the fabrics produced soon attracting the attention of buyers because of their peculiar excellence. The establishment took deep root and prospered, and the business expanded until, in 1878, the original founder associated with himself John T. Peel, a young man of excellent business capacity, and thereafter to the present time the style of the firm has been Barnes & Peel, and under this name their goods have achieved an enviable reputation in the market.

At the same time that the copartnership was formed the top floor of the Machinists' Association building, on the opposite side of the street, was leased and occupied, and the business extended.

Since that date the firm have once more outgrown their facilities and about the close of 1881 removed to the immense stone structure, named the Granite Mill, of the Barbour Flax-Spinning Company, recently erected on Grand street, West end, where a full equipment of the very latest improved machinery was placed, and the business again very greatly extended. A large portion of the machinery is from the shops of the best machine-builders in the Eastern States, and the braiding plant, which includes nearly 1,000 machines, is the largest to be found in any one establishment in the United States. In the production of silk and mohair braids, for ladies' dress trimmings, for tailors' use and other purposes, this firm is without a rival in the country. Their goods of this class are found in every market and always command a ready sale. Large quantities are sent West and South and everywhere the trade mark of Barnes & Peel is recognized as an assurance of superiority of fabric. Their serges, lining silks and other broad goods are equal, to say the least, to any met with, either domestic or imported. From fifty to seventy-five looms are running constantly on these goods.

The new factory, of which Barnes & Peel are the first occupants, on a long lease, is ranked as one of the finest in the State. It is an imposing building, in size 405x50 feet, three stories, with walls three feet in thickness, and built in the most substantial manner throughout. Great care has been taken to render it as nearly fireproof as possible, and the safety of the operatives in case of fire has been an especial study in its erection, the corner towers being fitted with elevators and the stairways built of stone, affording ample egress and the utmost convenience. It is in all respects a model building.

The number of employes has been increased from about 200 to nearly 300, and to these from \$2,500 to \$2,800 is disbursed fortnightly in wages. From 1,000 to 1,200 lbs. of material is consumed weekly; the total product for 1882 will aggregate about \$400,000 in value. Very few, even among the enterprising silk firms of Paterson, have achieved so great a success in the same length of time, the growth having been uniform and healthy from the very outset.

J. PHILLIPS MACKAY.

ADDY MILL.

J. Phillips Mackay began the silk manufacture at Macclesfield, England, in 1844. He came to this country in 1864 and was engaged in business in New York until 1866, when, coming to Paterson, he was employed in the Murray Mill by John Ryle. Here he remained until 1872, in the meantime, from 1869 to 1872, being interested in the firm of Frederick Baare & Co. In 1873 he formed a copartnership with John C. Ryle, and the silk business was prosecuted under the firm name of J. P. Mackay & Co., at the old Addy Mill, where two floors, 45x90 feet each, were occupied. In

1875 Mr. Mackay began business on his own sole account, in the two upper stories of the Addy Mill, in Water street, J. C. Ryle occupying the lower floor with his throwing plant. In August, 1878, Mr. Ryle removed to his present location, in Ellison street, Mr. Mackay taking entire possession of the Addy Mill. In September, 1880, the new wing of this mill was completed, 45x110 feet, three stories, which Mr. Mackay at once filled with machinery of the latest improved patterns.

When fully equipped there were about 140 looms in operation, the power-loom being located in the new wing, where, also, in the lower stories, was placed a full plant of throwing machinery, including 2,500 spindles, winders, doublers, reelers, etc.; also a full plant of silk finishing machinery. This establishment consumes about 40,000 lbs. of raw silk per annum and employs from 250 to 300 hands, to whom are paid wages aggregating \$150,000 yearly. The product is wide in its range, including broad silks, handkerchiefs and specialties in great variety. All designs are made in the mill, and the pattern cards cut there, for exclusive use. A forty horse-power Buckeye engine and two powerful turbine water wheels supply the motive power.

Mr. Mackay has always been conspicuous and foremost in every effort to place the silk trade of this country on a sound footing. He has served as Secretary of the Silk Industry Association of Paterson since its organization, and has spent much time, thought and money for the general good of the business.

JOHN C. RYLE & CO.

CENTRAL SILK MILL.

Probably one of the best informed and most practical men in the silk business of Paterson is the head of the above-named firm. Previous to coming to this country, which occurred about 1865, Mr. Ryle had acquired experience in the trade in Macclesfield, England, where his father had long been identified with the silk manufacturing interest as senior member of the house of R. & W. Ryle. During his residence in Paterson John C. Ryle has been engaged in various branches of the silk trade. About 1876 he organized his present business of commission throwing, and by careful and able management has built up one of the largest establishments devoted to that business exclusively to be found in the city.

The mill occupied, and which was formerly known as the "Byard" or Central Market, has a frontage of seventy-five feet on Ellison street, and runs through the block 300 feet. Being but one story high it has the advantage of abundant light from the roof and affords great facility for supervision. The machinery is driven by a sixty horse-power cut-off engine, and the exhaust steam is utilized so as to thoroughly heat the mill, even during the coldest weather.

The interior of the mill is arranged in a series of communicating rooms designed by their location to afford the most convenient and satisfactory prosecution of the business. On one side of the main entrance hall the visitor finds successively, the offices, the stock-room, where the raw silk is received, stored and

assorted; the soaking-room, where the silk is washed, and the drying-room, in which it is subsequently exposed to the moderate heat arising from proximity to the engine and boilers.

In the winding and doubling-room, wherein is found the majority of the help employed, the machines are conveniently arranged on each side of a central aisle, so that although the department is extensive every operative is under the immediate observation of the foreman. The spinning-room, which adjoins the winding section, is about 230 feet long, through the entire length of which runs a line of shafting revolving at high velocity, and communicating motion to a great number of spinning frames, twistors and reels all arranged systematically and bearing evidence of superiority in the name of the builders, the Danforth Locomotive and Machine Company. The dramming and finishing departments, which receive the special attention of the proprietors, are for that reason convenient to the office.

There is about the whole mill an air of business thrift and thoroughness that gives assurance of a complete and well-ordered establishment. The excellent system observed is largely the result of the personal oversight and management of G. G. Tillotson, the junior partner, a most accomplished and energetic gentleman, of rare business qualifications.

J. H. BOOTH & CO.

UNION SILK WORKS.

This firm, whose mill is at the corner of Market and Spruce streets, is composed of John H. Booth and Stephen Van Winkle. Mr. Van Winkle, who may justly claim the honor of being a pioneer of the silk industry in Paterson, though not among the very first, began to manufacture April 9th, 1859, in Van Houten street (then called "Boudinot" street), in the rear of the old Van Winkle machine shop, since absorbed by the Phoenix Manufacturing Company. This beginning has already been noted. Mr. Van Winkle started with thirteen hands, running 300 spindles and producing about seventy lbs. of silk yarn a week. At that date, in the silk as well as other mills, the hands worked twelve hours every day. After remaining at this location about three years Mr. Van Winkle moved to the old Beaver Mill, where he remained several years, when, about 1865, he formed a copartnership with John H. Booth, of Brooklyn, N. Y., the present senior partner, and Albert Hobley, of Williamsburgh, N. Y., a ribbon weaver. The property at present occupied, known as the old Union Works, long devoted to the machinery and cotton manufacture, was purchased and the business grew apace. The new firm was styled J. H. Booth & Company, which name is still retained.

About 1878 the interest of Alfred Hobley was purchased by the other partners and he retired. From 90 to 100 hands are now employed, to whom are paid \$950 fortnightly. Product per week, 400 lbs. of tram, 250 lbs. of organzine, 75 lbs. of floss and 150 lbs. of sewings; total, 875 lbs. The plant consists in part of nearly 2,000 spindles.

GEORGE FROST & SONS.

ALBION MILL.

George Frost has been engaged in the silk manufacture since 1838, when he was still in his early boyhood, his special department being from the first the throwing of yarns. He commenced business in this country about 1870 with but four hands, having come to Paterson from Macclesfield, England, where his family are engaged largely in the silk manufacture. •

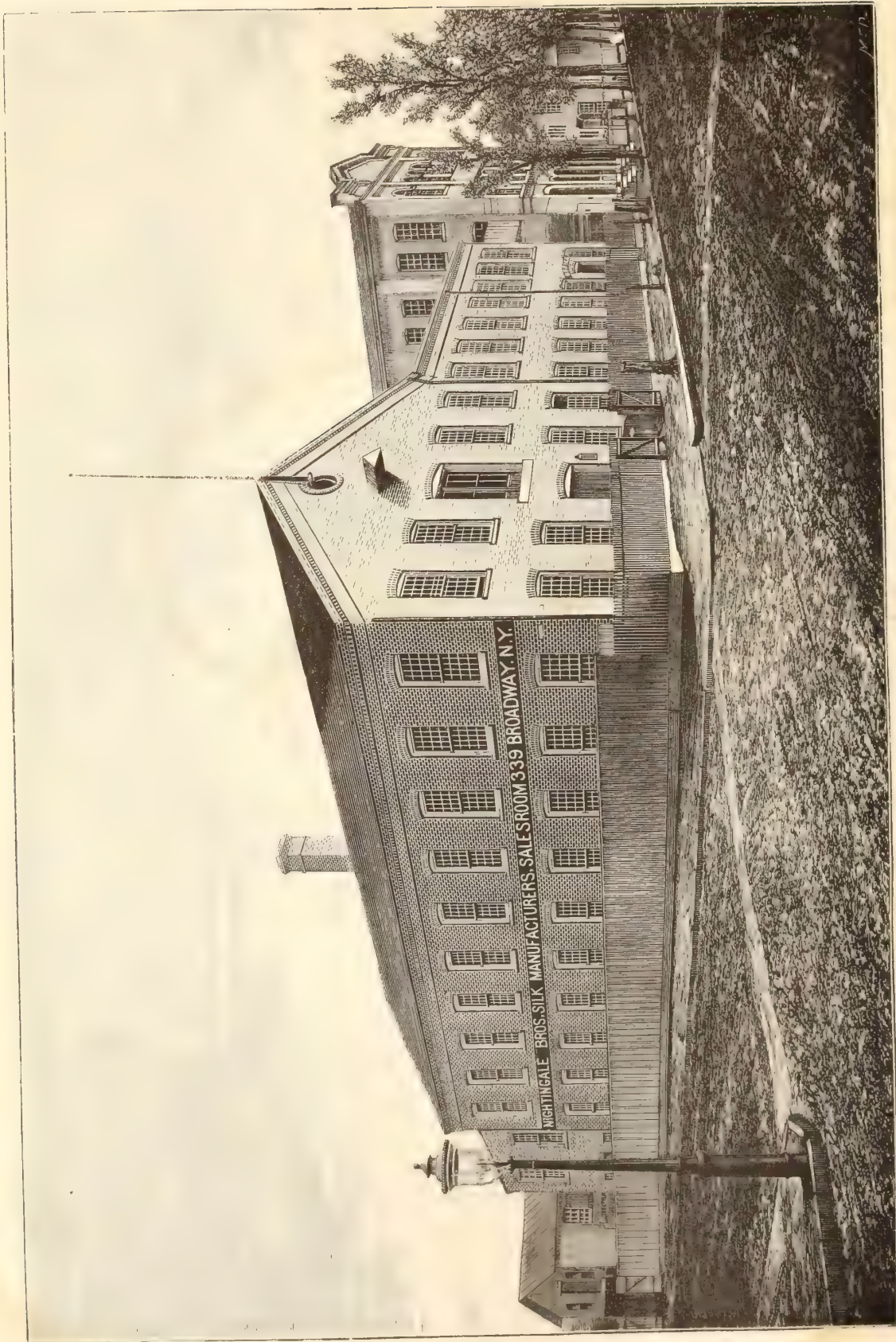
For many years he carried on the business in a portion of the Union Silk Mill, built by Dunlop & Malcolm, on Straight street, corner of Morton street. In 1880 Mr. Frost, in connection with his two sons, Frank and Harry B., whom he admitted to partnerships, built the Albion Mill, with a frontage of 100 feet on Madison street, a width of forty-five feet, three stories high, giving 13,500 square feet of flooring space. Built of brick in a most substantial manner, and with an air of taste too rarely seen in factory buildings, the outside appearance of this mill is very pleasing, but it is only by inspecting the interior that its perfect completeness and adaptability to the work required can be appreciated. The walls are sixteen inches in thickness, resting on solid foundations; the stairs leading to all the stories are of solid oak timbers; the ceilings are fourteen feet high and the building stands free, so that there are windows on every side. The roof is of slate and the building is fireproof. A ninety horse-power boiler and one of Green's patent cut-off engines of fifty horse-power furnish power and heat in abundance. The capacity of the mill with 175 hands at work is 700 lbs. of organzine weekly, and the same amount of tram. Every foot of space on the three floors is filled with machinery, mainly American-built.

Frost & Sons throw exclusively on commission. This firm were the first to introduce in Paterson the celebrated Atwood machinery, for which great superiority is claimed, their spinners, doublers and winding frames being especially excellent.

M. J. HAWKS & CO.

HAMILTON MILL.

Some years ago M. H. Chapin for a time occupied the "Old Stone Mill," at Haledon, the property of the Passaic Water Company, as a silk factory. The plant, which was a considerable one, was disposed of to C. B. Auer about 1871, and in time removed to the Gun Mill, where it was purchased by M. J. Hawks & Co., a firm in which M. H. Chapin was a principal partner. The Auer plant was soon removed from the Gun Mill to the Hamilton Mill, its present location. Here large additions have been made by this enterprising firm, until their business is now classed with the largest of any in their line, not only Paterson, but in the country. The production consists mainly of galloons, braids, Prussian bindings and other narrow goods, and through the use of improved machinery and the adoption of



NIGHTINGALE BROTHERS' SILK MILLS,
PATERSON, N. J.

superior methods the firm are able to produce articles equal to those from any foreign looms, and the enterprise is very successful. The throwing and yarn-glazing are done on the premises, the equipment being very full in every department.

Every process in the treatment of silk, from the raw in bale to the finished product, is carried on here, and under the experienced eye of a member of the firm.

The premises occupied consisted of the two upper floors of the Hamilton Mill, each 40x80 feet in size, until the beginning of 1882, when a portion of the new building adjoining, recently completed by Robert Adams & Co., was leased, and here a number of new looms were placed and other machinery added, the business expanding rapidly. About seventy-five looms are in motion and nearly 200 hands are employed. W. T. Everngham, a partner in the firm, is in general charge of the manufacture, and his great experience is of incalculable advantage in the production of the peculiarly excellent class of goods for which M. J. Hawks & Co. have achieved a wide reputation.

NIGHTINGALE BROTHERS.

NIGHTINGALE MILL.

This firm is composed of John and Joseph Nightingale, sons of the veteran silk manufacturer, James Nightingale, Sr.; the location of the industry is the factory purchased by them near the close of 1881, of the Atterbury estate, and for many years known as the "Boudinot Mill," on Straight street corner of Ellison street. Here, about the date of the purchase, a complete new plant of throwing machinery was added, and the equipment of the mill is now very full in every department.

The brothers Nightingale began to manufacture first in 1878, with a very few looms, and have been remarkably successful, their goods standing high in the market. Their production includes all classes of silk fabrics, plain and figured dress goods, satins, tie silks, brocades, tissues and gauzes, with a fine grade of handkerchiefs as a specialty. The firm sell their own productions at their salesroom, No. 339 Broadway, New York, and thus dispense with the services and save the profits of middlemen.

The equipment in the weaving department consists in part of 200 looms, about fifty having been added early in 1882. The capacity of the throwing department is 500 lbs. of yarn weekly. The mill, which is 64x84 feet in size, has been refitted throughout, an 80 horse-power Buckeye engine put in, and a considerable addition built for occupancy as offices, etc. There is a branch of this establishment in Pearl street, over which James Nightingale, Sr., is manager, where forty hand-looms are in motion. About 250 hands are employed.

GEORGE L. BROOMHALL.

ASHLEY & BAILEY MILL.

The history of the beginning of the silk enterprise now conducted by George

L. Broomhall, at Riverside, in the Ashley & Bailey Mill, is somewhat peculiar. Mr. Broomhall came to Paterson from Mohawk, Herkimer County, N. Y., to visit relatives, and in looking about among the "lions" of the place was shown through a silk mill. He had never seen a silk loom and was entirely ignorant of the processes of silk manufacture, but becoming enamored of the fascinating industry he resolved to enter the field. Returning home, he procured the funds necessary to a very humble beginning, and started in June, 1878, in the old paper-box factory in the Gun Mill group. The first year he had only six looms, but prospered steadily; the second year he had eleven looms. In February, 1880, the business was removed to the Northern end of the Ashley & Bailey Mill, at Riverside, where, shortly after, Mr. Broomhall was involved in the elemental catastrophe, in the form of a tornado, which nearly demolished the building. Though the roof was entirely off the mill and the costly machinery and goods in process of manufacture exposed to the elements, so prompt and effective were the measures taken that very little actual loss resulted, and the industry was steadily prosecuted, with but little interruption.

The space occupied here is equivalent to 6,500 square feet, which is packed as closely as possible, consistent with successful operation, with the latest and best improved machinery, the plant including about 60 power-loom, a considerable number having been added in 1881. The product consists in part of handkerchiefs and dress goods, which are unexcelled by any in the market for design, color and finish.

The secret of the wonderful success of Mr. Broomhall, who in the beginning lacked all the advantages of experience and had but very little capital, is found in his natural qualifications for the beautiful industry, which is so nearly allied to art; his close attention to the details in every department of the business and his determination from the outset to produce none but the very best fabrics. In pursuance of this idea the best talent is employed and the finest material used, and the result fully illustrates the wisdom of such a course, Mr. Broomhall's product selling readily while inferior fabrics are passed over and left on the shelves of commission merchants. Many of the goods from Mr. Broomhall's looms are not only unique in design but are altogether original, and of surpassing richness and beauty. From 140 to 150 hands are employed, and the fortnightly pay roll averages \$2,500. The yarn used here is mainly prepared by outside throwsters.

THE PIONEER SILK COMPANY.

MURRAY MILL AND GUN MILL.

This company, of which John Ryle, the patriarch of the silk industry, is President, has been established about three years, and is engaged largely in silk throwing and ribbon weaving, at the Murray Mill, in Mill street, fully described in a former chapter. The plant consists in part of 100 ribbon looms and 10,000 spindles. About 500 hands are employed and the amount disbursed in wages averages \$5,500 fortnightly, about \$145,000 per annum.

There is also a branch industry, and a very important one, located at the Gun Mill, where the manipulation of silk waste and pierced cocoons was carried on extensively for a time, and will be again, without doubt. Mill waste was formerly, up to within a few years, sent to England to be manufactured, the pioneer establishment of the kind in Paterson, and the second in the country, being that of the Pioneer Silk Company, at the Gun Mill, of which William Souter, Jr., was for a time Superintendent. He afterward found employment with the Nonotuck Silk Company.

The business was discontinued for several months during 1880, but was continued later by Phipps & Train, who carried it on until near the close of 1881, when the machinery was again idle. This extensive plant of spun silk machinery was purchased about 1868 by John Ryle from the "Velvet Company," who failed most disastrously in Paterson about that time. The machinery was imported at a cost of from \$50,000 to \$60,000. William Souter, Sr., the father of the above-named, was Superintendent for the Velvet Company during its brief existence.

THE WINFIELD MANUFACTURING COMPANY.

The Winfield Manufacturing Company was organized April 13th, 1881, with a capital of \$20,000, for the purpose of engaging in the silk manufacture: President, C. H. May; Vice-President, Samuel Thorp; Secretary and Treasurer, A. D. Winfield. The company occupy the large brick structure on Eighteenth street, formerly the location of the Elvin Chemical Works, where they do a large business in the production of braids, galloons, Prussian binding, etc., employing about fifty hands, to whom are paid in wages \$450 to \$500 fortnightly. The product averages in value \$50,000 per annum, and the goods command a ready sale owing to their superior excellence, being regarded in the market as equal to any of their class imported.

The present company is an outgrowth of the firm of A. D. Winfield & Co., who began business in 1878 at the old Union Works, in Spruce street. The gentlemen comprising it are each experienced manufacturers as well as shrewd and far-seeing business men, and the future prosperity of the establishment seems to be assured.

HOPPER & SCOTT.

HOPE MILL.

This firm occupy two floors of the Hope Mill, the business being throwing silk exclusively. They have been established since 1879. Organzine and tram are the specialties of the firm, and their advance has been very rapid, and continuous, since the start. At first they began with 1,200 spindles; at the close of 1881 they were running 3,500 spindles. Their machinery is of the latest improvements of the Danforth Locomotive and Machine Company—which means the best in the world. The product is consequently of superior excellence.

The mill is peculiarly well situated for throwing, as it is located between and

contiguous to two raceways, thus ensuring at all times a certain amount of moisture in the atmosphere, which causes the silk to "behave" better during its manipulation. Sixty hands are employed. The product aggregates from 500 to 600 lbs. of yarn weekly.

H. H. FREEMAN & CO.

John H. Smallwood, the "company" in this firm, began the silk manufacture in a very small way in Fletcher's building, in the rear of 110 Straight street, in 1873. In 1876 Henry H. Freeman, who had been senior member of the firm of Henry H. Freeman & Co., silk merchants, of New York city, associated himself with Mr. Smallwood, and shortly afterward the business was removed to the Union Silk Works, where the equipment was increased and the business expanded and became prosperous. In April, 1881, the firm removed to a new frame mill, erected on a plot of thirty city lots purchased from the Society for Establishing Useful Manufactures, on Front street, Totowa, above the Falls bridge, a slightly and beautiful spot. This, which was the pioneer out-and-out silk mill in this delightful suburb, is 42x120 feet in size, three stories, and the addition of a brick building of the same dimensions, will probably be commenced some time in 1882, to increase the facilities of the rapidly growing industry.

An 18 horse-power boiler and a 15 horse-power engine furnishes the power to drive the machinery; 50 hand and 25 power-looms are included in the equipment, and 150 hands are employed; the fortnightly disbursement in wages averages \$1,500. The product is largely silk veilings, grenadines, broad silks, dress fabrics and handkerchiefs.

J. L. CHAPIN.

J. L. Chapin, first located at the Arkwright Mill, vacated by A. Hinze & Co. in 1880, afterward removed to the Dunlop Mill, on Straight street. With seventy-five looms and the other necessary machinery, except what is required in throwing, and with the work of 200 hands, this establishment produces a quarter of a million dollars worth of goods annually, mostly dress silks, which include a wide range of patterns in brocades, satins, grenadines, etc., as well as serges, millinery goods, trimmings and all kinds of broad silks which the condition of the market may require. The manufacturing department is in charge of J. J. Birsfelder, late of Eklings & Birsfelder, who has had twenty-seven years' experience, and is well known as a manufacturer in broad silks as well as in narrow goods, first in Switzerland and afterwards in this country. Three floors of the mill are occupied by Mr. Chapin, and the industry is a growing one.

ASHLEY & BAILEY.

RIVERSIDE MILL.

Dwight Ashley and Peter Bailey are among the most successful of Paterson's silk manufacturers. Both are experienced and skillful silk workers, understanding even to its finest shadings every detail of the art-industry, and they give to every department of the business their personal supervision. Mr. Bailey, who is a native of Macclesfield, England, was inducted into the mysteries of the silk business when a small lad. After coming to this country he was employed by John Ryle and, it is claimed, wove the first piece of broad goods—a dress fabric—ever attempted in Paterson. Mr. Ashley's experience, also, has been wide. Together they began to manufacture in a small room on Straight street about 1873, each partner having one loom. Later they occupied the Jaffray Mill, adjoining the Danforth Locomotive Works, where they increased their business, the space occupied there consisting of five stories, each 85x44 feet. Early in 1880 the firm removed to a new factory, erected by them on a site purchased near the River street crossing of the Erie Railway, at Riverside. This was built for and is especially adapted to the requirements of the industry. Power is introduced from an engine located in a disconnected building, a part of the property. In this mill the weaving of goods only is carried on; the throwing of silk, *i.e.*, the manufacture of tram and organzine, is done at Fort Plain, N. Y. In the Riverside Mill 100 power and 25 hand-looms are kept busy, and 200 hands find employment. The line of goods produced comprises silk handkerchiefs of all sizes in endless designs and colors. The firm make a specialty of union handkerchiefs, a mixture of silk and cotton, of which they turn out an immense daily production. Dress fabrics and other broad goods also are manufactured, the product having a wide range.

A few months after their occupancy of the new mill a serious casualty befel the firm, a sudden tornado sweeping over the city, unroofing their building and prostrating a portion of the walls. Many other buildings suffered at the same time and numbers of the largest trees in the city were uprooted. In an incredibly short space, however, the damage was repaired and not long afterward a considerable addition to the mill was built.

Toward the close of 1881 thirty power-looms were added to the plant. A 50 horse-power engine drives the machinery at the weaving mill, and a similar one the throwing machinery at Fort Plain, N. Y., where about 125 hands are employed. Here the mill occupied, on a ten years' lease, is 100x40 feet, two stories, and the product is from 450 to 500 lbs. of yarn weekly, all of which is woven at the Riverside Mill. The amount paid in wages in the two branches of the industry averages about \$3,800 fortnightly, or nearly \$100,000 per annum.

J. JACKSON SCOTT.

In the year 1852 J. Jackson Scott was foreman of the twisting, by hand, depart-

ment for John Ryle, in the old Gun Mill. Mr. Scott was born in Glasgow, Scotland. Being a practical silk worker he obtained employment as foreman immediately upon his arrival in this country, and in this capacity he was engaged in several mills. He went to Massachusetts at one time, and worked for a while at Pittsfield, but soon returned to Paterson. About 1870 he started on his own account in a very small way, and from this humble beginning built up a business that, at the time of his death, produced \$300,000 worth of goods a year. His factory was in the upper part of the Grant Locomotive Works, and gave employment to about 200 hands.

During the first week in October, 1881, Mr. Scott was in New York city, engaged in attending to his business, and in the evening started for the ferry to embark on an Erie Railway train for Paterson. Precisely what occurred to him that night will probably never be known. He was found later in the evening by a police patrolman lying unconscious in a hallway in Greenwich street, whence he was taken to the police station, and thence, some hours afterward, he managed to reach his home in Paterson, where he died a few hours later, without having fully recovered his consciousness. He had been robbed by New York ruffians and injured in some way—perhaps by the administration of drugs—which is still inexplicable.

Mr. Scott was best known as the friend of everybody in need. He expended several fortunes in helping struggling silk concerns, and scarcely a failure occurred during the decade between 1871 and 1881 but he was one of the largest creditors. He lost nearly \$30,000 by one bankruptcy alone. He suffered to nearly that amount in 1881 by various failures in the silk business. But these things never seemed to cripple him, and until toward the last scarcely worried him. He was ever ready to give a bond or become bail for some unfortunate person, and it is in his character of a "Good Samaritan" that he is best known to and will be most largely remembered by the people of Paterson. His plant of machinery, which was very extensive, was purchased for about \$8,000 by J. D. Cutter, once a prominent Paterson silk manufacturer, but who for several years has been located in Newark.

THOMAS ARMITT,

A native of Leek, Staffordshire, England, came to this country about 1869, and soon found his way to Paterson, where, through his townsman, the late J. Jackson Scott, he found employment in Saunders' silk mill, in a portion of the Grant Locomotive Works. Later he engaged in business on his own account, and for several years, up to 1881, he occupied a portion of the Central Silk Mill, where he made fishlines, twists, sewings and various specialties. Mr. Armitt is a most accomplished manufacturer of hand-made sewings, a staple in his native town, and has written excellently on the peculiar processes of this branch of the industry. During 1881 he perfected an invention, and made the necessary machinery, whereby he produces what is known as the "Armitt hook band," for silk, cotton and woollen spindles, which new band seems a vast improvement on any heretofore used, being both

more effective and more economical. Many thousands of these bands are now in use. Mr. Armitt's present location is in the "Little Beaver" Mill, at the head of Broadway.

FRED. W. ALCOCK.

Fred. W. Alcock, formerly a designer for the Phoenix Manufacturing Company, in March, 1881, purchased the silk machinery of E. B. Penrose, who had failed, and entered upon the silk manufacture in the Dale Mill, where his productions include a superior class of dress fabrics, scarfs, handkerchiefs, etc. The Penrose plant consisted of thirty-two power-looms, and to these Mr. Alcock soon added as many more. About seventy-five hands are employed. The productions of this mill have attracted much attention in the market, rich and heavy dress silks being a specialty. The enterprise has expanded steadily, the proprietor being an experienced manufacturer and very energetic. He has been engaged in the silk business since his boyhood, and, being a practical designer, makes his own patterns, which insures marked originality of product.

E. B. Penrose, whom Mr. Alcock succeeded, started in business in Washington street in 1879, and moved his plant thence to the Dale Mill, in 1880. His failure was most honorable. He subsequently went from Paterson to Philadelphia to assume a responsible position with a silk firm of that city.

CRESCENT MANUFACTURING COMPANY.

CRESCENT MILL.

This establishment is located in the old Fred. Baer mill, built by that gentleman in 1868-9 on Rip Van Winkle avenue, where he failed a few years later, and was succeeded by Sterrett, Ryle & Murphy, who failed in 1877-8, when the plant was bought by Peter Ryle, a son of John Ryle. The Crescent Manufacturing Company was afterward formed, the mill was refitted and re-christened, new machinery of the most approved patterns was put in and the business, largely that of silk throwing and the manufacture of braids, was firmly established and rapidly increased in importance.

The company has shown great energy, and will doubtless in time take front rank among Paterson silk manufacturers. About 1,500 spindles are in motion and other throwing machinery in proportion. The company employ fifty hands, to whom is disbursed fortnightly \$600, or about \$15,500 per annum.

WILLIAM BUSCHMANN.

This firm, formerly composed of William Buschmann and August Trautmann, were successors to Latus & Trautmann, who failed at the Dale Mill in the Autumn

of 1881. Both Mr. Buschmann and Mr. Trautmann are experienced silk manufacturers, and come from the same province in the "Rhineland" of Germany, Mr. Buschmann being a native of Barmen-Eberfeldt, and Mr. Trautmann of Crefeld. Of Barmen-Eberfeldt a trade journal recently said that scarcely a civilized man could be met with who did not wear, either in cloth, buttons, braid, silk tie or some other article of raiment or trimming, a production of that city, famous the world over for the vast variety of its manufactures.

Mr. Buschmann has been residing in this country since about 1866, and the first engagement he had after his arrival was with the late Thomas N. Dale, at the Dale Mill, where he was in full charge of the ribbon department. Mr. Trautmann came from Crefeld in 1878, and was employed by Dexter, Lambert & Co., William Strange & Co., and others, until the formation of his partnership with ex-Assemblyman Jacob Latus, which resulted in a disastrous failure in the Summer of 1881.

The new firm, Buschmann & Trautmann, were located at Haledon, on the property of the senior partner, at one time known as the Benjamin Brundred homestead and later as the residence of E. K. Rose, a fine premises, the grounds being extensive and the buildings ample. During the Winter of 1881-2 the firm dissolved partnership, Mr. Trautmann retiring. A small building is occupied for the manufacture, but it is in contemplation to build a mill during the year. About twenty-five looms are included in the plant, and new ones, for ribbon weaving, are being added; also throwing machinery. The product includes handkerchiefs, broad goods, ribbons and novelties.

ALWELL URBACHN.

Alwell Urbahn, the location of whose business is at 93 River street, is a natural genius, and, like most geniuses, has not been remarkably successful, financially. Men of his class are frequently found to furnish the ideas out of which some other less talented, but more practical, men coin money.

Mr. Urbahn also, like William Buschmann, is a native of Barmen-Eberfeldt, Germany, in the Rhine country, which he left for America twenty years ago. For some years after his arrival he did nothing but study and experiment with machinery; later he was master mechanic at the establishment of Waterhouse Brothers, Passaic City; later still he started a small machine shop of his own, in Prospect street, Paterson, where he spent two years in perfecting a ribbon loom, for which he claimed superior excellence, but which proved to be too complicated for successful operation. About seven years ago, in 1875, he began to manufacture silk at No. 93 River street, his present location, since which he has prosecuted the business with varying success, employing at different times from ten to twenty-five hands. The product is mainly novelties, although it includes a variety of handkerchiefs, scarfs, neck ties, suspenders; also broad goods.

About the close of 1881 Mr. Urbahn began to produce plush-fur, which he wove on a loom of his own invention and for which it is claimed that it will revolutionize trade in that class of fabrics. These goods are woven first in a loose web

with slack twisted chenille-like yarn, and afterward the nap is brought out by a peculiar treatment with ingenious machinery. When finished the goods are probably the best imitation of seal fur ever produced, both sides being alike. For many uses, such, for instance, as rich cloak trimmings, the new fabric is especially adapted and will probably become popular. Mr. Urbahn is full of inventions, having produced numberless original machines and improvements, very few of which he has had patented, and none of which have given him wealth.

C. B. AUER & CO.

C. B. Auer purchased a plant of silk machinery of M. H. Chapin, at the "Stone Mill," Oldham, some years since, removed it to the Gun Mill, and after running it there for a time disposed of it to M. J. Hawks & Co. Later, about 1877, Mr. Auer started again, in a small room in the Gun Mill, from which he removed to a shop in the rear of "The Senate," Van Houten street, whence he removed to the Murray Mill, where he was at one time associated with Ferdinand Grossenbacher, who afterwards built and now occupies the Centreville silk mill. About 1879 Mr. Auer was running a few looms in the Hope Mill for a time, when he sold his plant to Eking & Birsfelder. His removals and changes of manufacture have been so frequent that it has been very difficult to arrive at a clear understanding of them. He was until quite near the close of 1881 weaving broad goods, including satins, brocades and handkerchiefs, at the Murray Mill, running his own and a number of looms belonging to the Pioneer Silk Company. He subsequently removed to Tariffville, Connecticut, where he was a principal member of and manager for the Hartford Silk Company. Early in 1882 he dissolved all connection with the company, selling his interest therein for \$15,000, returned to Paterson, and, purchasing a considerable weaving plant near Philadelphia and associating with himself George Spangenmacher, he embarked in the business anew, at the Hope Mill. The firm have 50 looms in motion and the business is steadily growing. Mr. Trautmann, late of Latus & Trautmann, is Superintendent.

JOHN LOCKETT

commenced the manufacture of handkerchiefs, dress silks and millinery fabrics in Washington street, September 10th, 1878, but soon after removed to Ramapo avenue, to the old foundry and moulding shop formerly of Peter Van Houten, or Van Houten & Hatrick. He started with three looms and six hands, but soon after the removal employed 25 hands and ran 15 looms, hand and power.

During 1881 Mr. Lockett removed to the Dale Mill, where the business is rapidly expanding. Mr. Lockett has a thorough knowledge of the art of designing, thereby saving much expense. In building and establishing a business from very small means he has earned an excellent reputation as a young and enterprising

manufacturer. He has thirty looms running, employs forty hands, to whom \$800 is paid fortnightly in wages ; annual product, \$40,000. The goods are rated high in the market, being of peculiar excellence and very original in design.

SOUTHWORTH BROTHERS

have been established since 1875. The location is on Morton street ; product, silk handkerchiefs, broad silks, dress fabrics, etc. At the beginning they had but 50 hands and 20 looms ; in 1879 they employed 125 hands and had 55 looms running, paying fortnightly \$1,400, equivalent to about \$35,000 per annum, in wages. The business has grown rapidly, increasing in every department during 1880 and 1881, the equipment and operative force being doubled and the production proportionately increased, including rich satin brocades and other dress fabrics in designs original with the firm.

Southworth Brothers were awarded a gold medal in each of the years above-named, at the Cincinnati Industrial Exposition, for superior excellence in the manufacture of silk handkerchiefs and dress goods. They have received four gold medals in all at various times and for different classes of goods.

JAMES F. McALISTER,

successor to Jackson & Harshaw, who began to manufacture in the Empire Mill, in 1879, occupies two upper floors in this mill, each 50x150 feet, and is prosecuting a prosperous and growing business as a silk throwster. He has added largely to the original plant, until his equipment is now quite extensive, including from 2,500 to 3,000 spindles of the Danforth and Atwood patterns. Sixty hands are employed, and the product will average 750 to 800 lbs. thrown silk per week.

Mr. McAlister entered the field first in December, 1877, in company with a gentleman named Conlin, the two leasing about 1,000 spindles from George Morlot, at Riverside, where the business was at first prosecuted. In November, 1880, Mr. McAlister purchased Mr. Conlin's interest, purchased also the machinery then in operation, from Mr. Morlot, added thereto much more and, July 1st, 1881, removed to the Empire Mill, taking as a partner William M. Collier, whose name, however, does not appear. The new firm is bright, persevering and energetic, and will, doubtless, achieve marked success.

HOWELL & SCHOALS.

" DUCK MILL."

This firm grew out of the house of Schoals & Howell, manufacturers of silk goods, at No. 34 Walker street, New York, with their factory at Paterson, where

Jerome Vacher was in charge, using his own plant of machinery and receiving a commission therefor and for his services. In the Spring of 1881 the reorganized firm of Howell & Schoals purchased Mr. Vacher's plant and assumed full charge at the factory; since that date the business has been prosecuted with vigor and success.

Some of the very finest goods in the line of handkerchiefs, dress fabrics and other are included in the product, which will average from \$100,000 to \$125,000 yearly. About fifty looms are in use, and 100 hands are employed. The plant of machinery, at the close of 1881, was valued at \$25,000. The premises occupied consist of the upper floor of the main building and lower floor of the West wing at the old "Duck" Mill, about 7,000 square feet of flooring space. The best French and Italian silks are used at this mill, and the varied products are unsurpassed by any in the market for beauty of color, originality of design or perfection of finish. Some of the specialties are marvellous productions of textile art.

JEROME VACHER

came to this country from Lyons, France, in 1870, and engaged in the silk business in a small way in Paterson, in the old "Stone Mill," at Oldham. He was a silk weaver at home, where his father is still a silk manufacturer of note. By industry, and the excellence of his fabrics, Mr. Vacher gained a place in the market for his goods, and his business steadily increased, until he was at the head of a prosperous establishment in the "Duck Mill," occupying two floors and running thirty to forty looms.

About 1879 he associated with himself Mr. Howell, since of Howell & Schoals, and in the Spring of 1881 sold his plant to that firm and began business anew at No. 93 River street, where he equipped a room with a considerable number of looms, purchased in part from Joseph Nussey. His product is mainly handkerchiefs and dress fabrics. He employs about 25 hands.

THE NEUBERGER BRAID COMPANY

are manufacturers of silk braids, fancy goods, bindings, galloons and kindred products, and silk throwsters on commission. They occupy two floors in the old "Duck Mill," West wing, over Howell & Schoals, where they employ 85 hands; at times many more. Included in the product is an average of 600 lbs. tram and organzine weekly. A full equipment of the most approved machinery, including a large number of superior braiding machines, together with a practical knowledge of the business, enables the firm to make a class of goods that compares favorably with anything in the market.

The members of the firm are T. and H. Neuberger, brothers; they began business in 1879. About the close of 1881 a new engine was placed in this establishment and an increased number of braiders. The general manager, A. Wietlisbach,

is an experienced silk manufacturer as well as a skillful mechanic, and the marked success of the establishment is largely due to his excellent method and wide experience. It is in contemplation by the company to purchase or build a large factory as soon as an eligible site can be secured.

FRED BAARE.

CENTRAL MARKET MILL.

Fred Baare is located at the Northern end of the Central, or Byard, Market, Van Houten street, where he has been very successful as a silk throwster. Mr. Baare came to Paterson first in 1869 and engaged in broad silk weaving in the Murray Mill, where he remained until 1873. While there he imported the celebrated Honnegger warping machine, which enabled him to produce broad goods much cheaper than by the old method. It could be operated by unpracticed hands, while the other machines required experts. The excellence of this machine, then for the first introduced, is said to have been conceded by all after a time, and most of the leading manufacturers now use it, the warpers being manufactured by Benjamin Eastwood, Ramapo avenue, and other machinists.

Mr. Baare formed the Baare Manufacturing Co., and removed from the Murray Mill to South Paterson, thence to Philadelphia, and thence to Sauquoit, N. Y., where he attempted to introduce broad silk weaving, which was not a very signal success. Mr. Baare had been engaged in the silk business before coming to Paterson, at 48 Howard street, New York; at Union Hill, where he introduced ribbon weaving, and at Schoharie, N. Y. He is a veteran manufacturer, who has little to learn of the manipulation of silk.

GREGSON & McCULLOCH

are manipulators of mill and other waste and pierced cocoons, from which they manufacture spun silk. In other words, they are carders and spinners of silk that is, from any cause, no longer a continuous fibre, and from this product, called spun silk, is manufactured sewings, filloselle, crewels, embroidery silks, fine yarns for weaving, etc. Their factory is at No. 42 Van Houten street, in the rear of McCulloch's brass and copper works, where some of the most ingeniously constructed machinery known in the silk manufacture—all imported—is used in the various processes.

The firm commenced operations with but four hands in February, 1879, Matthew Gregson, the senior partner, an experienced spun silk manufacturer, from Congleton, England, having been induced to come to Paterson by Robert McCulloch, an ex-Alderman of the city, who at the same time imported some of the very best spun silk machinery to be procured in England. Since that date much more machinery has been imported; also large quantities of the pierced cocoons.

There is probably not another as extensive spun silk plant in the country, except that of the Cheney's and, perhaps, those of the Pioneer Silk Company and of the Nonotuck Silk Company, at Florence, Mass. Besides these there are but two or three others in the United States, one of them being that of Pfeffer & Wels, at the Pope Mill, and another that of the Griswolds, Philadelphia, who are frequently compelled to have the more difficult processes of manufacture performed for them by Gregson & McCulloch.

The processes to which the rough and apparently worthless waste is subjected before the fibre can be saved and the real waste eliminated—for there must be fibre; there is no such thing as silk shoddy—are truly wonderful to the uninitiated. Among others, the silk is passed through a "gasing-machine," to burn off the roughness and inequalities, which seems as though it must ignite the delicate fibre, but it very rarely does. The spun silk is used in conjunction with reeled silk usually, but not always, for the production of inferior fabrics. There are many things about this department of the silk industry both curious and interesting. From 50 to 60 hands are employed by Gregson & McCulloch, whose business is steadily growing in importance, there being no rival establishment in operation in Paterson at the beginning of 1882, Pfeffer & Wels not having yet begun to manufacture, being engaged in fitting up their mill.

PAUL CRAWFORD.

DALE MILL.

Paul Crawford, late of Hayes & Crawford, who occupies commodious quarters in the Dale Mill, Railroad avenue, has been engaged in the silk manufacture since 1877, the business having steadily expanded until the establishment is now one of the most prosperous in this American "Lyons." Over 8,000 square feet of space is occupied and from 75 to 100 hands are employed.

Every stage of the silk manufacture is represented here, the equipment being of the most complete description, the product of the first machine shops of the country. More than fifty looms, with Jacquard attachments, are run on handkerchiefs, scarfs, tie silks and plain, figured and brocaded dress fabrics, in endless variety. The productions of the firm in the handkerchief department are especially noteworthy, presenting an elegant assortment, the designs, quality and shades comparing favorably with any goods in the market, domestic or foreign. All the fabrics from Mr. Crawford's looms are remarkable for their beauty of color and combinations of shades, as well as for their originality of design and exquisite finish. They are not excelled by any, and are justly popular with buyers and command a ready sale, a rare tribute to the skill and enterprise of this young manufacturer, who, like many others now among the most successful in Paterson, was formerly an employe of the Phoenix Manufacturing Company.

P. DORGEVAL.—SILK WEAVER AND MACHINIST.

DALE MILL.

P. Dorgeval, an inventive and enterprising silk manufacturer, silk dyer and machinist, formerly a member of the Paterson Dyeing and Finishing Company, is located in the Dale Mill, where he has about fifty looms running on broad silk goods and manufactures a patent power-loom of his own invention, and which is regarded as a very important improvement.

Mr. Dorgeval is a native of France, and has had large experience as a weaver and also as a constructor of machinery. In Lyons, France, about twenty years ago, he invented a power-loom that, after many difficulties, was accepted by the majority of silk manufacturers there and has been used since by them. He claims to be the pioneer builder of French power-loom for weaving gros grains, as before his day no successful power-loom had been generally received by the French manufacturers for that purpose. The loom recently patented by Mr. Dorgeval is an improvement on his former French invention, and in all respects a simpler and better machine. It might with propriety be called the universal loom, for any class of goods can be woven upon it. It is a fact that English looms are adapted for one kind of work and French looms fitted for another character of weaving, and often the remark is heard : "My looms are stopped because I cannot make the class of goods the market requires." The Dorgeval loom is intended to solve this difficulty, and it is claimed that on it can be woven any kind of silk goods—gros grains, brocades, plain and fancy silks, handkerchiefs, etc., with equal ease. Several are running in Paterson and they have met with much favor.

JOHN FLETCHER & CO.

have a neat factory in the rear of 110 Straight street, where they produce some very superior goods in the way of silks and velvets. The senior member of the firm is a veteran manufacturer, whose entrance to the field has been noted in a preceding chapter. The "company" is composed of his son and brother, both named William. Probably the first velvet ever made in Paterson was woven by John Fletcher in his own house, at No. 106 Straight street, about 1864. The loom was a primitive concern, but the product was of superior character. However, the venture was not a paying one. During 1880 and 1881 the product was largely silk plush; the fever running high in this class of goods. The business of the firm is expanding and their goods are always in demand in the market.

JOHN GRISH, successor to Grish & Buttendorf, who in 1879 began the manufacture of broad silks, handkerchiefs and novelties, at No. 10 Smith street, with fifty hands and twenty looms, after the dissolution of copartnership removed to the Benson Mill, in Bridge street, whence he removed to the Barnert building, in Rail-

road avenue, where the business has steadily expanded, the equipment and operative force having been increased from time to time. The space occupied is one floor, 30x90 feet.

WHITEHEAD BROTHERS began first to manufacture in Merrill's building, River street. Later they purchased the plant of Townsend & McGrogan, seven power and twenty hand-loom, and removed to the top floor of the Barnert building, Railroad avenue, where they added still more to their equipment, and at the close of 1881 had about forty looms running, the product being mainly silk handkerchiefs and dress goods. The firm is composed of William H. and Frederick G. Whitehead.

JONES & BENTLEY have for several years been manufacturing dress goods and handkerchiefs at their frame mill, No. 124 Oak street.

JONES & HOPPER began the manufacture of broad silk dress goods and kindred products at the Watson Mill, in 1880, running about forty looms and other machinery. The firm afterward dissolved, Mr. Hopper continuing the business at the Watson Mill and Mr. Jones making a new start, in Oak street, in a small way. Mr. Hopper is also interested, with W. D. Holmes, in the Dover Silk Company, of Paterson and Dover.

GEORGE SINGLETON, silk throwster, whose early career has already been noted, runs a large plant at the Watson Mill, mainly on commission, for large manufacturers. Tram, organzine, sewings and machine twist are among the products. Mr. Singleton has invented many improvements in silk machinery, and is among the most steadily prosperous and, at the same time, among the most conservative of Paterson manufacturers. He is interested also in the Singleton Manufacturing Company, at Dover.

F. C. SCHMIDT & Co. have been established since about 1879 in the rear end of the Dale Mill, where they do quite an extensive business in silk winding and throwing on commission.

THE NEW YORK SILK COMPANY were located until recently at the Franklin Mill, where they were successors to William Ashley, who was one of the firm of Nightingale & Ashley, established in this mill in 1879. Wright Smith, who up to the early part of 1880 was a large manufacturer, but who in that year became insolvent, was Superintendent at the Franklin Mill for the New York Silk Company, his large experience rendering his services extremely valuable. When the company failed, both at Marion and at Paterson, in 1881, Mr. Smith succeeded them. The product is dress and umbrella silks, handkerchiefs and other broad goods.

GEORGE JOHNSON manufactures handkerchiefs and other goods in a modest way at No. 34 Van Houten street, mainly on commission, having been established since 1879.

CARLISLE & Co. manufacture Jacquard lacings, silk watch-guards, fishlines, etc., at the Union Works, by the locomotive shops, where they have been established over four years. Braid machines running, 130; knitting machines, 5; employes, 20; pay roll, \$225 fortnightly.

LOUIS BRUCHET, who is located in River street, has been manufacturing hand-

kerchiefs and dress goods since about the beginning of 1880, running a few looms and employing not many hands.

JAMES SKELTON, formerly of the firm of Martin, Skelton & Co., occupies space in the Hope Mill, where he is running a number of looms on handkerchiefs mainly.

J. H. ROGERS succeeded to the occupancy of the space and the ownership of the plant of Ekins & Birsfelder, who began to manufacture in the Hope Mill, in 1879, Mr. Rogers added largely to the equipment, removed to the Murray Mill and is doing quite an extensive business in the production of dress goods, handkerchiefs and novelties. He had as partner T. D. Chittenden, formerly of Hough & Chittenden, dealers in musical instruments, until the beginning of 1882, when he retired.

JOHN DAY, who, as senior partner of the firm of Day & Scott, failed about 1872 began again in the silk manufacture in the old Dunlop Mill, second story, where he stayed until 1877, when he moved into the new portion of the mill, where he remained but a short time when he became embarrassed, but after a time started anew at his present location, No. 93 River street. Mr. Scott, his former partner, is a superintendent at the Grant Works. The product at Mr. Day's factory is mainly broad goods.

MARTIN, ADAMS & Co. are engaged in the manufacture of handkerchiefs, millinery silks and dress fabrics, at Nos. 55 and 57 Van Houten street, in a modest way.

DUMAS & TABER are located in a small mill in Mechanic street, and are producing dress goods, bolting cloths and loom crepe. They have a branch establishment at Roslyn, L. I.

JOSEPH DAY manufactures ribbons in a small mill at No. 66 Mechanic street, running about ten looms.

GREENWOOD BROTHERS are engaged in silk throwing, on commission, at No. 51 Mechanic street.

JOSEPH FLETCHER does a considerable business as hard silk winder and silk throwster, at No. 119 Tyler street.

SAMUEL LUCAS manufactures dress, millinery and tie goods and handkerchiefs, in the Washington Market building, Fair street; a thrifty and growing business.

JAMES WALTHALL, a veteran silk manufacturer, of over thirty years' experience but who has not been very successful, is engaged in manufacturing in a small way thrown silk, on commission, in Van Houten street.

JEREMIAH MARLAND, who began in 1879 the manufacture of silk handkerchiefs, grenadines, gauzes, etc., at 93 River street, and afterward removed to the Dale Mill, discontinued business during 1881, and his plant was sold to the Corriveau Silk Company, Montreal, Canada, and taken thither, Mr. Marland going out of the business.

A. GAZZARI, at the Oldham Mill, is doing a considerable business in silk throwing and other branches. The firm was Geannetti & Gazzari until 1881.

A. GEANNETTI, formerly of the firm of Geannetti & Gazzari, Oldham, after the dissolution of the copartnership, which occurred in 1881, purchased an entire new silk plant in Italy, his native country, and is located in the Barnert building, Railroad avenue, where he is very successful.

CATHARINE VAN NESS, the widow of the late Giles Van Ness, an eminent fringe maker, who exhibited his products at the New York Crystal Palace, is running a few looms at No. 85 Water street.

ANDERSON & SON, at the Totowa Mill, are constantly increasing their facilities, the product including handkerchiefs, dress goods and scarfs. This establishment is prosperous and the business a signal success, though the beginning was small.

P. & I. BANNIGAN, at Lake View, have been engaged in the silk manufacture several years and the business is rapidly expanding. The Messrs. Bannigan have about 200 hands employed and use a very superior equipment of machinery, the product including a wide range of broad and narrow goods.

NED GRANT runs a few looms, in Paterson street, near River, on handkerchiefs mainly.

JOHN NEEDHAM manufactures broad silk goods, in a small factory, in Sherman avenue, corner of Henry street.

HENDERSON BROTHERS are located in Front street, near the Falls bridge, where they run a few looms on handkerchiefs and other goods, of superior quality.

W. LITTLE & Co., at the Totowa Mill, Kearney street, are successors to James Nightingale, Sr., a patriarch of the silk manufacture, who is now a superintendent at Nightingale Brothers' branch establishment, in Pearl street. W. Little & Co. are very successful and the business is a growing one.

JAMES NIGHTINGALE, JR., at the Dale Mill, first floor, employs a number of hands and runs twenty looms on fine dress silks, handkerchiefs, scarfs and kindred products. He frequently has two Jacquard machines running on the same loom, to produce complex patterns, a new thing to Paterson, though not uncommon in England. Mr. Nightingale had a large experience in silk weaving in England before he came to this country, which he did in 1865. He is one of a large family of notable silk manufacturers.

THE DOVER SILK MANUFACTURING COMPANY was formed early in 1882 by C. C. Hopper and W. D. Holmes, with Mr. Holmes as President, and Mr. Hopper as Treasurer, and the two upper floors of the Pope Mill were leased for two years from Pfeffer & Wels, lessees of the entire building. Here a full equipment of superior machinery is to be placed for the production of broad goods and a variety of silken fabrics. Each member of the company continues to manufacture in his individual capacity also, Mr. Holmes in Fair street and Mr. Hopper at the Watson Mill, but a consolidation of all their interests is contemplated.

PFEFFER & WELS leased the Pope Mill for a term of five years, in January, 1882, and imported a large and costly plant of spun silk machinery from Europe, with the intention of utilizing the mill and other waste procurable in Paterson and elsewhere. Mr. Pfeffer has had large experience in this peculiar branch of the silk industry, having been in the management of a vast spun silk establishment in Germany, and having manufactured from the same crude material in France and Italy for many years. Mr. Wels is not a manufacturer. The first floor only of the mill will be occupied at first, though an early expansion of the business is probable.

W. D. HOLMES has been established at No. 11½ Fair street since about 1877, where he is engaged in manufacturing dress goods and handkerchiefs. It is a prosperous and steadily increasing business.

ROBERT HARDY is manufacturing dress goods, on commission, at No. 104 Straight street, employing a few hands.

J. COLLE, at No. 360 Main street, has a small place where he manufactures chenilles and other specialties.

C. CROUCHLY, at the Dale Mill, has a few looms running on handkerchiefs and dress goods.

THOMAS SHERRATT manufactures broad goods, running a few looms, at No. 60 Railroad avenue.

A. POCACHARD is an experienced manufacturer who for the past four years has been producing dress silks and novelties at No. 173 Market street, Smith & Jackson building, where he has about forty looms running.

WILLIAM BALL runs a few looms on handkerchiefs and other goods, at No. 93 River street, employing about ten hands.

EUGENE VOGELSANG, who represents the American branch of a powerful Crefeld house (Germany), and is engaged in the manufacture of silk fabrics for men's scarfs and ties mainly, occupies space in the Dale Mill, where he succeeded Latus & Trautmann. He is running about ten looms, on specialties.

PHILIP HAYES, former senior member of the firm of Hayes & Crawford, has since 1880 occupied a neat mill on his own premises, on the Little Falls road, West Paterson, where he employs about thirty hands and has twenty to twenty-five power-looms running on broad goods for dress fabrics, handkerchiefs, etc.



CHAPTER XXXIV.

THE SILK INDUSTRY.—DYEING.

WHILE noting the establishment of the pioneers in the silk industry, in connection therewith has been given also a brief sketch of the earlier among the silk dyers, and it remains now to record the later arrivals and describe the present status in this department.

The operations of Brown & Mayer, who started in 1859 in a very small place in Straight street; of Albert King, who succeeded this firm and continued dyeing in Paterson until 1873, when he went to the Oneida Community; of John O'Neill & Sons, whose dye-house was located on the site of the present establishment of the Weidmann Dye Works—all these have been described in detail as fully as need be. Following these earlier silk dyers came

CLAUDE GREPPO,

who has had many years' experience in the art of silk-dyeing in Europe as well as in this country. Mr. Greppo is a nephew of M. Bernaud, one of the most eminent silk dyers of Lyons, France, and in 1866 came to Paterson and established himself in the business of dyeing silks. He has thorough chemical knowledge, large experience, and the facilities afforded by an establishment fitted up with costly apparatus.

When Mr. Greppo first began silk-dyeing in Paterson he occupied the Ward street mill until, in 1867, the Greppo Mill was built, where silk-weaving and dyeing both were carried on, and the establishment soon became one of the most extensive in Paterson.

In 1871 a large chemical works was erected in Kossuth street, Totowa, by Mr. Greppo, for the manufacture of acids and other materials used in silk-dyeing, their prime projector being an enthusiastic Frenchman of a scientific turn, though of somewhat visionary character, according to the account given. After a two years' trial this enterprise was abandoned, much good money having been sunken, and the works were left standing, the site being still marked by the ruins and a tall chimney stack fast crumbling to the ground.

In 1876 Mr. Greppo formed a copartnership with Jacob Weidmann which lasted

about two years ; subsequently each continued to prosecute the business alone. Mr. Greppo, at the close of 1881, was occupying a portion of the Greppo Mill, sold to the Grimshaw Brothers in 1878, and he was also President of

THE PATERSON DYEING & FINISHING COMPANY,

which was established about 1875. The business of the company is dyeing and refinishing piece goods. It is a large and important industry, at first located in the Benson Mill, Bridge street, but later in the new dye works built on lots that were a portion of the Barbour Brothers' property, adjoining the Greppo Mill proper. Up to the time of the sale of the Greppo Mill to the Grimshaw Brothers, the company occupied a portion of the mill proper for finishing and the dye-house for the dyeing department. After the sale, the space being wanted by the new owners, the finishing department was removed to the Gun Mill, but subsequently all the departments of the industry were concentrated at the new and extensive buildings erected by the company at Riverside, West of the Erie Railway track, where about 150 hands are employed.

THE WEIDMANN SILK-DYEING COMPANY.

Jacob Weidmann, now at the head of what is, without doubt, the largest silk-dyeing establishment in the country, is a native of Zurich, Switzerland, where his father was proprietor of one of the most extensive dyeing concerns in Europe, now conducted by his eldest son. This establishment is represented as being thoroughly equipped and manned, and with a reputation extending to all industrial centres of the world.

Jacob Weidmann grew to early manhood in an atmosphere most favorable to his after career, and when of proper age was received as an apprentice in his father's works, and served his full time precisely the same as any other apprentice, neither asking nor receiving any special advantages or indulgences. After completing his apprenticeship he proceeded to Basle, Switzerland, where he "finished" his course and then, determined to know all that was to be learned of dyeing, to become thoroughly familiar with all methods and possessed of all the many secrets of the peculiarly delicate processes, he travelled through Germany and France for several years, working here and there for a time and then passing on. At Lyons, France, he stayed longest, that city being most noted of all for its advancement both in silk production and dyeing.

At about the age of twenty-two years Mr. Weidmann came to this country and was engaged for the space of six years with Cheney Brothers, at Manchester, Conn., whence he came to Paterson, where he was for a time foreman in the dyeing department at the Dale Mill. In March, 1874, he began business on his own account. The buildings at the corner of Paterson and Ellison streets, formerly occupied for silk-dyeing by John O'Neill & Sons, were purchased, they having long been idle, and here the commencement was made under the most favorable auspices, Mr. Weidmann being at the time regarded as one of the most skillful dyers in the business and possessed besides of all other qualifications calculated to ensure success.



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In February, 1876, Claude Greppo closed up his establishment at the Greppo Mill, and a partnership was formed under the firm name of Weidmann & Greppo, which lasted about two years, when the firm was dissolved. After the dissolution, Mr. Weidmann prosecuted the business alone and achieved a great success. In January, 1882, a stock company was formed, with Jacob Weidmann, President, and John Eastwood, Treasurer, the title being "The Weidmann Silk-Dyeing Co."

In 1878 a considerable extension was built to the works, which have since been further extended until, as now existing, they comprise the following: First, a frontage on Paterson street of eight city lots or about 200 feet, with a depth of 100 feet, the buildings being partly one and partly two stories. On the other side of Paterson street, about five city lots are occupied by the new works, completed in 1879, and which consist in the main of a fine building with a front of 25 feet on Paterson street and a depth of 100 feet, together with an extension 60x175 feet, one story, used mainly for the dyeing of heavy blacks, this company and Messrs. Greppo and Morlot being the only dyers of heavy blacks in the city. The new building first mentioned is occupied in part as an office, which is one of the finest in Paterson. The balance of the building is occupied for storage, dyeing, etc. The front of this building is of pressed brick, with stone trimmings; it is highly ornate and presents a very striking and attractive appearance in that locality. On this side of the street has been erected a large boiler house and a tall stack, which latter object first strikes the eye of those passing from the Erie Railway station on Market street. Here are the three great Elvin boilers, built by Samuel Smith after the new invention of Andrew Elvin, and regarded by many experts as the best boilers now in use, on various accounts that need not be more than referred to here. These boilers are of 225 horse-power each, and the heated steam to be used in the processes of dyeing on the opposite side of Paterson street is forced through an eight-inch wrought iron pipe to and under Paterson street, to the distance of over 350 feet directly into the works on the Eastern side of the street. This is a real novelty in the conveyance of steam.

Although all colors are dyed at this establishment, yet the great specialty is the dyeing of heavy blacks, which is a much more difficult matter than the dyeing in fancy colors. Dyeing silk in the skein is the principal line followed, and in it this establishment excels all others in the amount of business done. From employing but about twenty hands, which was the number seven years ago, the business has grown until now there are 400 names on the roll, a large force to find employment in a dyeing establishment, for each hand can manipulate a large quantity of the product, as any one giving the matter a thought will readily understand. This is, without doubt, the very largest, finest, best equipped and in every way the most important establishment for silk-dyeing in the country.

SEE & SHEEHAN.

This firm, the members of which are Raphael G. See and Daniel J. Sheehan, commenced business as silk dyers October 4th, 1869, succeeding John O'Neill &

Sons in the occupancy of the well-known premises at 209, 211 and 213 Paterson street, which were purchased by them of the assignee of the O'Neill estate. February 1st, 1872, the buildings were burned, but were immediately rebuilt double their original size.

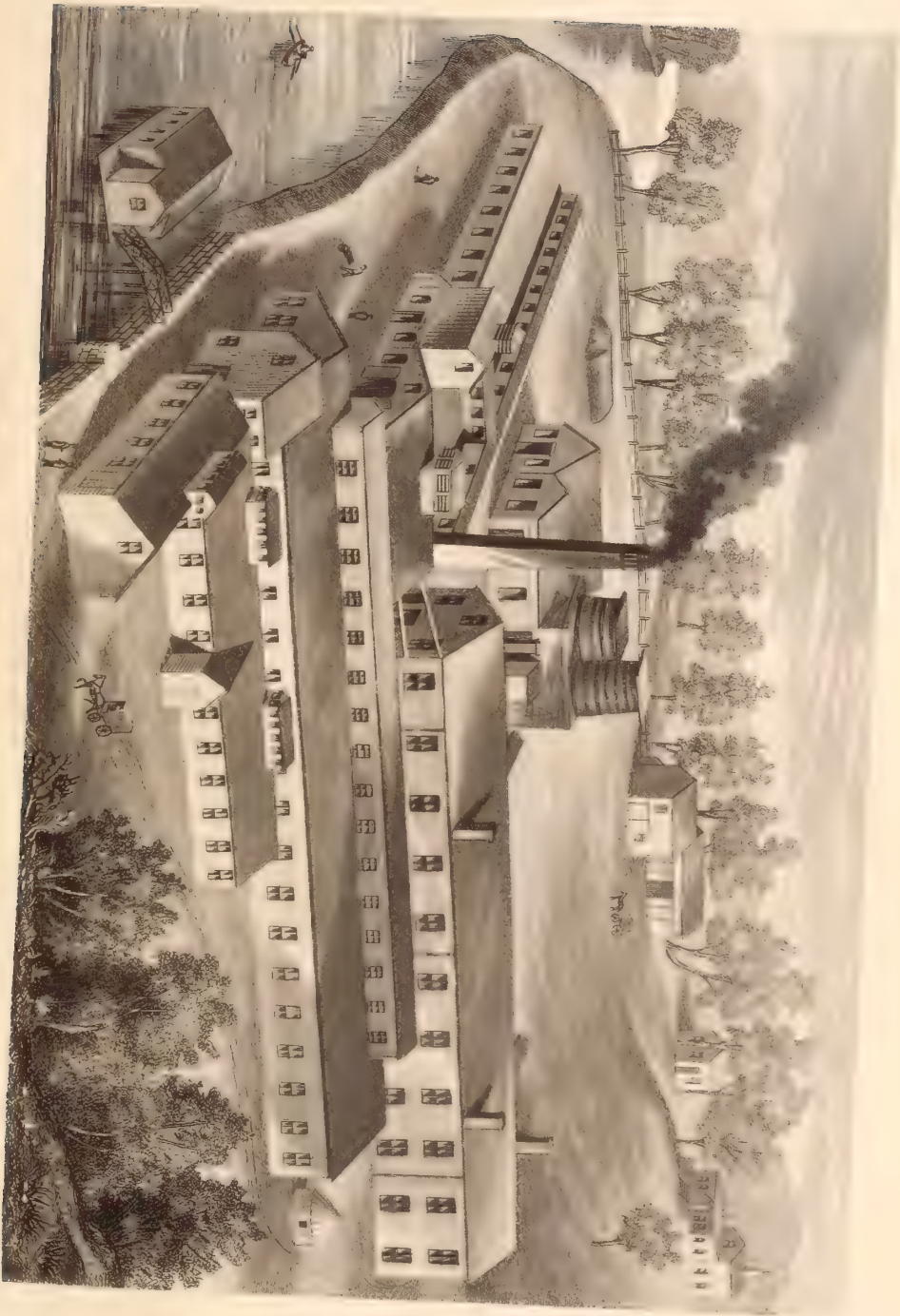
The senior member of the firm came to Paterson from New York city, where he had been engaged in business; Mr. Sheehan, the junior member, had been employed by the O'Neills previous to their failure at this location. The enterprising firm, now about twelve years established, have advanced steadily toward success, and occupy a front rank among the most skillful dyers in the country, while in certain departments they have no successful rival. Their great specialty is dying in colors.

As the result of the most careful study and exhaustive experience, added to a practical and thorough knowledge of the beautiful art, a large number of colors and shades of color can be produced in a single skein of silk. The perfection attained in this branch is very wonderful, the variety and beauty of the work being well nigh inconceivable without a personal inspection. The firm claim originality of method in this particular line, and it is, no doubt, safe to assume that in fancy color-dyeing they are in advance of all competitors in America. Blacks of all kinds also are produced, but colors are the great specialty. The premises occupied are 75 feet front by 156 feet in depth, with a principal dye-house 100 feet square. Between fifty and sixty men are employed, to whom \$1,500 are paid fortnightly in wages.

GEORGE MORLOT'S DYE WORKS.

George Morlot was born in Lyons, France, in 1836, and has been engaged in silk-dyeing since 1853. At the age of seventeen he graduated in the departments of chemistry and mathematics at a high institution of learning in his native city, and almost at once entered on the duties of Superintendent and General Manager of the extensive dye works of Vignat Freres, St. Etienne. At the age of twenty-one years he assumed the position of Superintendent of the works of Savigny & Bernaud, of Lyons, where he remained until his departure for this country, in 1864. In 1865 he began business for himself on Third avenue, New York city, whence he removed to Williamsburgh, in 1866. In 1869 he came to Paterson and associated with himself as partner a Mr. Stettheimer, the firm being established about 1870 on the bank of the Passaic, at Riverside, Mr. Morlot's present location, where extensive works were built. Here Mr. Morlot has been very successful, and, his reputation as a dyer having become widespread, much work is done for Philadelphia and still more distant cities.

The present aspect of the Morlot Dye Works is that of a considerable hamlet, there being thirteen distinct buildings, seven of them of considerable size, as follows: main building, 200x50 feet, of brick; another, 160x30 feet, frame; another, 135x25 feet, three stories, of brick; a frame structure 160x30 feet, and three others of brick and frame, each about 50x60 feet; there are also six detached buildings



used as store houses and other dependencies. One and a half acres of land are covered with these works. The usual number of hands employed is 150; annual disbursement for wages, \$52,000. The water facilities at the location are very superior, including, besides the river, a spring of singularly pure water, invaluable in light color-dyeing.

PATERSON SILK-DYEING ASSOCIATION.

Pierre Thonnereaux, who came from France in 1873, having been employed in one of the first dyeing establishments in that country, was a workman for Claude Greppo at his mill before the latter formed a partnership with Mr. Weidmann, in 1876. Mr. Thonnereaux then went to Manchester, Mass., where he was employed by the Cheney Brothers. He remained there until 1876, when he returned to France, but came to America again in 1877 and, in company with J. Heidenrich, started a silk-dyeing business in the Gun Mill. The partnership lasted but a short time, when Mr. Heidenrich withdrew and soon after the enterprise was abandoned. Mr. Thonnereaux then started anew, and alone, at Madison Park, but did not continue long.

A short time afterward the Paterson Silk-Dyeing Association was formed, consisting of Mr. Thonnereaux, Thomas Clark and another. Mr. Thonnereaux is now sole proprietor. The Association seems very prosperous, the line of work including black, colored, shaded and other variety dyeing. The location is in the Franklin Mill, Mill street.

FAURE & MEISTER.

Among the silk-dyeing firms of some note at one time was Faure & Meister, who occupied the Benson Mill prior to 1872, and who continued in business until about 1874-5, when they closed up, after which Mr. Faure became a foreman at the Weidmann Works, in the color department, where he remained until about 1876; subsequently he returned to France, his native country.

The finishing of piece goods formerly constituted a separate department of the silk industry, but of late years it has grown into increasing prominence, owing to the introduction of improved processes by means of which the most lustrous finish can be imparted to silks and satins, enhancing their beauty and bringing them out smooth, spotless and fresh. All first-class dress goods, millinery goods, satins, silk handkerchiefs and ribbons now pass from the loom through the hands of professional finishers, who at a very small cost, and by the mediums of heat and pressure, give to them that highly finished appearance which prepares them for the sales-

room. They come from the loom flamp and dull and leave the finishers' hands bright and clean, with the vividness of colors and patterns well brought out. Among the foremost engaged in this department in Paterson are

CREW & HENSHALL,

who occupy a front rank among those who contribute to the superior excellence of Paterson silk productions. This firm have been established as silk and satin-finishers at the Dale Mill since 1880. Both partners had had large experience in finishing, with the same class of goods which they now treat, in Macclesfield, England, having worked for a number of years in the oldest silk-finishing house in that city. They came to Paterson with the latest improved English machinery, and are very successful.

During the year 1881 they increased their facilities greatly, and the fine lustre and high finish which adds so greatly to the beauty of domestic silk and satin fabrics are here imparted with such success that the business is rapidly growing. The range of work includes embossing, hot-pressing, watering and all the processes connected with finishing.

THE AMERICAN SILK-FINISHING COMPANY

began business during 1881 on the lower floor of the Empire Mill, Green street, where they occupy space 50x125 feet, as silk and velvet-finishers, and the enterprise promises to prove a success. The goods prepared for market here have a notably fine appearance.

CREW, SONS & CO.

have been established in the Watson Mill, 104 and 106 Railroad avenue, as silk-finishers, since 1879.

William Crew and his sons, who are the partners in this firm, belong to an old family of English silk-finishers, having been in the business in Macclesfield and London before coming to Paterson. As far back as 1830 Mr. Crew served as a silk-finisher in Macclesfield, and consequently has little to learn about his art. Special care is exercised in finishing all grades of grenadines. Crew & Sons employ eight calendering machines for dress goods, and a special machine for handkerchiefs. Their capacity is one hundred and seventy-five pieces of dress goods of fifty yards length, and 1,000 dozen handkerchiefs a day.

BARLOW & GRUNDY.

This establishment is located at Riverside, where it has a monopoly of a special department; to wit: that of dyeing cotton threads for use in conjunction with silk. This firm have a very considerable establishment and are making a success of their specialty. They employ about thirty hands.

A. ZUBER

is located at 116 Water street; his department is silk-dyeing in general. Mr. Zuber commenced business in 1874 and in 1875 built his present works, 25x30 feet, with an extension 30x21 feet, occupied in part as a receiving shop. Here all manner of fancy coloring is done.



CHAPTER XXXV.

THE SILK INDUSTRY.—WEAVERS' SUPPLIES.

HERE is still another class of manufacturers to whom some space must be devoted in the description of a variety of subsidiary industries, all of which tend directly to the prosecution of the silk manufacture proper. There are a goodly number in Paterson engaged in the furnishing of silk manufacturers' supplies of various kinds, and as all in this department has special reference to the manipulation of the silken fibre it must be considered in this connection.

JACOB WALDER

is located at No. 188 River street, where he manufactures reeds and heddles, and weavers' supplies generally. Mr. Walder stands quite at the head of his business in Paterson, and, probably, in this country. His dealings are not with Paterson manufacturers only, but he has a large custom from the New England States, for, strange to say, Mr. Walder produces goods that even those ingenious Yankees have never yet made, though that may sound almost incredible.

Mr. Walder has been engaged in "harnessing" and equipping looms in Paterson for the past sixteen years, or since 1866, when he commenced, with his own two hands only, in Military Hall. After a six months' stay he removed to Cross street, where, also, he stayed six months, employing one operative. Next we find him occupying space over the establishment of Daggers & Row, where he remained five years, employing five or six hands. From here he removed to Merrill's building on River, near Main street, top floor, where he remained two years, employing twelve hands. The next removal was to the Manhattan Shirt Mill, where, also, he remained two years, employing eighteen hands. The next removal was made to the present location, where Mr. Walder had at first but a small shop, but soon he bought the premises and enlarged the shop to 20x100 feet, three stories, and extended his business to meet the growing demand. He now employs 70 hands and uses a 10 horse-power engine in his manufacture; pay roll fortnightly, \$600; value of product, \$40,000 to \$50,000 yearly.

All work is done under orders, and the range is large, including supplies for the silk, cotton and woolen industries. The steady growth of this peculiar industry is a very good barometer to indicate the advancement of the manufacture to which it ministers.

JOHN DECK

is a manufacturer of patent ribbon blocks at No. 93 River street, Merrill's building, where he began the business in 1874. Mr. Deck's product is largely a specialty, as indeed each of the articles furnished to weavers and others in the silk manufacture usually is with the maker, though there are exceptions. Mr. Deck employs from eight to twelve hands, and turns out about 5,000 blocks daily.

Mr. Deck succeeded J. Meistermann, who was the successor of J. G. Mayer, the business being of many years' standing.

JOHN ATKINSON & CO.

are located at No. 95 River street, where they began, in 1865, to manufacture bobbins, swifts, spools, risers, skate rollers, etc., etc., a wonderfully curious and interesting variety of goods, in the production of which much skill is displayed. When the business was first started the firm was Atkinson, Rooks & Co., and twelve hands were employed; now there are 35 hands, and the pay roll is \$550 fortnightly. Ten horse-power is employed in manufacturing. The premises consist of three city lots, whereon is the main building 40x40 feet, besides two storehouses in the rear. During 1876, when the fever for parlor skating ran high in England, the firm had a standing order for 1,600 pairs a week. John Atkinson & Co. make bobbins and spools for all the textile industries.

LABER & STOLZ.

This firm is located in the Benson Mill, Bridge street, where they manufacture reeds and heddles. They commenced business at 33 Prospect street, in February, 1878, and after about five months moved to 58 Ellison street and thence to their present more commodious quarters. At first but two hands were employed; now there are 25 to 30, to whom are paid an average of \$350 to \$400 fortnightly.

EUGENE ALARIC

commenced business at No. 394 Grand street, top floor, in 1879, and his work was at first all done within his own family. The product is a rare specialty, namely silk glass-ware, including quill eyes, winder guides, glass rodes, shuttle eyes, shuttle rings, males, etc. The business is very prosperous. Formerly all these goods were imported.

AUGUST LIOTARD

is another manufacturer of heddles and kindred articles for weavers' use. He started his business at No. 277 Straight street in 1875, and after remaining two years removed to No. 11 Prince street, where, also, he remained two years, his business continually growing; afterward, in 1879, he removed to his present location, No. 232 Market street, where he is very prosperous, employing, however, but a few hands outside his own family, who are all efficient workers.

W. B. COCHRAN

is one of the foremost in card-cutting for Jacquard weaving in the city. He commenced at No. 7 Prince street in 1878 with two boys; he removed to the Hamilton Mill and thence, after one year's stay, to 171 Market street, top floor, where he employs a number of hands. He imported a card-cutting machine from England in 1879 which turns out 10,000 cards daily. His business is mainly jobbing, and among his patrons are some of the foremost manufacturers in the city.

C. C. E. VAN ALSTINE

is located in the Washington Market building, Fair street entrance. The career in this city of Mr. Van Alstine has been a chequered one, and the "ups and downs" of sometimes "outrageous fortune" in his case rather remarkable.

Mr. Van Alstine came to Paterson first in 1872, and was employed by the Whitney Sewing Machine Company, but he was thrown out of work by the bankruptcy of the company soon after. He did odd jobs for two or three months, then hired a small place on Main street and engaged in the manufacture of optical glasses and in repairing sewing machines, etc., having but a small chest of tools and five dollars capital, kindly loaned by a good friend. After many reverses Mr. Van Alstine, who is very ingenious, invented a press to punch the eye of a lingo and shape the head at the same time. The silk business revived in 1877 and large orders came in from Paterson firms for Mr. Van Alstine's specialties. From employing but four or five hands he came to employ 175 to 200 hands in 1878, when he was compelled to enlarge greatly, and removed to the present location, where he has a full equipment of the best machinery. He now turns out 50,000 to 75,000 lingoes a day, using a fifteen horse-power engine. He has more than fifty different machines, some of the most complicated character, valued at \$8,000.

DAGGERS & ROW.

This firm, located at the corner of Mulberry and River streets, known as the Roswell Bobbin Manufactory, make all kinds of bobbins. They started first in

February, 1853, and after three months occupied Carter's place in Todd & Rafferty's yard ; they remained there six years, employing fifteen hands. Thence they moved to the present location, which was formerly a foundry, built a large addition to the shop and put in a 30 horse-power engine. Space, 120x36 feet ; hands employed, 25 to 30 ; pay-roll, \$500 fortnightly. The bobbins made here are noted for their superior quality, and goods are shipped to Massachusetts, Connecticut and most of the New England and other States. The firm have occupied the same place for more than eighteen years.

CHRISTIAN BREDDER

has a factory at No. 56 Sheridan avenue, where he commenced the manufacture of weavers' supplies, winding frames, etc., in 1875, at first in the basement of his dwelling house. Afterward he built a shop, 18x35 feet, two stories, where he has a five horse-power engine, and turns out work on orders only. Hands employed, from six to twelve.

JOHN STRAUB.

Mr. Straub began first in 1874, in Clinton street, the manufacture of weavers' supplies, his department being especially designing and card-cutting. After one year in Clinton street he removed to Mill street, stayed there one year and then went to 27 Hotel street, and after a stay of three years, removed to 199 Van Houten street, his present location. Not many hands are employed outside the family of Mr. Straub, the business not being of a nature to require a great number, yet he fills orders from Philadelphia, New York, Vermont and other Eastern States, besides the dealings he has with local mills.

ROBERT BROOKS,

also, is a designer and card-cutter, located at 175 Market street. He began first at the Phoenix Mill in 1872, working for the Messrs. Tilt. He removed to his present location in 1874 and is full of business, occupying 1,000 square feet of space, employing ten to fifteen hands and paying from \$150 to \$200 fortnightly.

JOHN B. EWING.

Mr. Ewing is located at room No. 8 Washington Market Building, where he began in January, 1879. He came to Paterson from Glasgow, where he had been engaged in making designs for tapestry. His work in this department is said to have been exceedingly beautiful as well as highly original, and he can boast of having furnished the designs for the tapestry hangings in the mansion of Lord Rosenberg, who married a Rothschild ; also for the hangings of Lord Beaufield's house in

London. His designs for silk handkerchiefs and dress fabrics are very unique and are much sought for. He not only designs but cuts the cards to a large amount weekly, employing a number of hands. Mr. Ewing claims to have taken the first prize at Paris for his productions.

ROBERT ATHAN

is located at No. 97 River street, where he makes looms, all kinds of silk weavers' goods, spindles, thilling machines, etc., etc. He began here in November, 1879, and now employs ten to fifteen hands. Mr. Athan was formerly the very efficient superintendent for the Van Riper Manufacturing Company, until he started in business for himself.

FREDERICK HARDING

is one of the largest manufacturers of paper boxes for ribbons, handkerchiefs and other silk products in the country. During 1881 he built a spacious brick factory on Straight street, near Ellison, where he gives employment to a large number of hands and carries on an extensive business, not only in supplying Paterson manufacturers, but others in distant cities. Another establishment in the same branch is that of

ROBERT BLACKBURN,

on Railroad avenue, nearly opposite the New York, Lake Erie & Western Railway depot, where he occupies a factory 70x30 feet in size, built substantially of brick. Mr. Blackburn has been engaged in the business of paper-box making for the space of sixteen years, and he finds an ample field in supplying the silk and other manufacturers with handkerchief, scarf, ribbon, braid and other boxes, besides which he furnishes Jacquard cards of all sizes and of a superior quality to the silk mills of Paterson, Philadelphia, Hoboken, Camden, and other towns.

DANIEL BROWN,

wood turner, at the Franklin Mill, has for thirteen years been engaged in manufacturing silk mill supplies, his specialty being spools and quills for silk machinery. He employs but a few hands, and occupies a building 30x28 feet, two stories, with a dry-house 35x25 feet, one story.

CHAPTER XXXVI.

THE SILK INDUSTRY.—RECAPITULATION.

THE history of the silk industry in Paterson has now been brought to a point beyond which it only remains to furnish a recapitulation of the foregoing statistics and other figures, largely comparative. This is important for the purpose of showing, as nearly as may be, the real magnitude of the business at the present time, and also to give an idea of its growth. But in the performance of this task, of comparison, especially, the way is beset with difficulties well-nigh insurmountable, not at all apparent at first, or even at second, thought to the casual observer. Of the present condition of the industry there is little difficulty in giving a satisfactory and accurate showing, as compared with like exhibits in most works of this character. A more thorough and persistent canvass could not well have been made, and nothing but the refusal on the part of a few manufacturers to furnish the required data has prevented the array of figures about to be presented from being absolutely full and as absolutely accurate. The instances of such refusal, happily, have been few, and the establishments not generally of the first importance, so that the result will not be greatly affected.

It is a matter of regret that the same cannot be said of the comparative statistics. Here were encountered many and great obstacles. The records of the silk manufacture in the past years are meagre, crude, imperfect, fragmentary and generally unsatisfactory. No effort has been spared, however, to secure all of importance that has been written on the subject, and, in addition thereto, all the unwritten testimony obtainable. Application at the office of the Silk Association of America, the natural depository of valuable silk data, from whence is issued from time to time the most important statistical information attainable bearing on the subject, resulted in a most discouraging response. The reply of the Secretary of the Association, William C. Wyckoff, in answer to the author's inquiry as to what proportion of the total raw silk import is consumed in Paterson, was as follows :

“The questions you propound cannot now be answered. There is an absolute dearth of data on the point at issue. After making an unusual effort to get the statistics that would have served this and other purposes I obtained such meagre and defective returns that I was unwilling to stake my own reputation for accuracy upon any deductions from these sources. Estimates by the best informed people in the

trade were too wildly at variance to help. "You can guess at the figures with quite as much probability of being right as I can."

Apropos to the above, it is found in the reports of the State Bureau of Labor and Statistics, annually published, that regret is expressed over the total inability of the compiler to obtain analytical data of the silk manufacture, even to show the product by States, since the publication thereof by the Silk Association ceased after 1875.

Even could absolute data be obtained as to the proportion of the total raw import manufactured in Paterson at the present time, this alone would not greatly assist in a comparison, for the proportion coming to Paterson mills has not been uniform even from one year to another, so rapid is the increase in the volume of business continually. That is to say, if Paterson last year, or in any preceding year, consumed a certain given quantity of the total import of raw silk, the same figures would not represent its proportionate share of the manufacture at any subsequent date. This must be very clear to all.

There is, however, a method, apart from the results of the canvass made, whereby we may arrive, at least approximately, at the proportion of the total raw import consumed by Paterson now. It is conceded of the raw silk import—first, that the ports of New York and San Francisco have in recent years absorbed about the entire volume, the proportion being in excess of 99 per cent. ; second, that from 92 to 95 per cent. of the total raw import is entered at the port of New York alone ; third, that Paterson for the past two or three years or more, especially, perhaps for the past decade, has consumed at least two-thirds of the total import of raw silk that finds its way into these two chief American ports. This is the estimate of the very best judges, and is consequently valuable as a basis of approximate estimate. The growth of the silk industry in Paterson has at least kept pace with its general advancement throughout the country in other sections, and it does not seem unlikely that the volume of silk manufactured in Paterson has borne approximately the same relation to the total American manufacture of this textile for a number of years past; the tendency, without doubt, being toward a greater absorption of the total import by Paterson from year to year. Regarding the subject in this light, the following table will be of interest, as giving the total import of raw silk for the past ten calendar years at the ports of New York and San Francisco, together with the proportion consumed in Paterson, according to the above estimate :

Years.	Total Imports.		Consumed in Paterson.	
	Bales.	Value.	Bales.	Value.
1872.....	10,907	\$7,167,534	7,871	\$4,778,350
1873.....	8,726	5,232,947	5,818	3,488,632
1874.....	7,942	3,913,213	5,295	2,608,808
1875.....	10,641	5,372,242	7,094	3,581,474
1876.....	11,237	5,600,877	7,492	3,733,878
1877.....	9,913	5,591,084	6,608	3,727,390
1878.....	13,734	6,807,725	9,156	4,783,484
1879.....	18,936	9,921,332	12,624	6,644,221
1880.....	20,899	11,478,727	13,932	7,652,484
1881.....	21,692	11,936,865	14,461	7,957,910
Totals for ten years	134,627	\$73,022,546	90,751	\$48,681,634

The manufacture of yarns, etc., of spun silk and pierced cocoons, a very peculiar industry, which was almost annihilated during the year of 1880, regained some of its onetime prosperity during the last two years. The following table of imports of waste silk and cocoons at New York and San Francisco during the past six years presents an array of rather curious figures :

Year	Bales	Value	Year	Bales	Value
1876	1,302	\$317,900	1879	3,829	\$1,153,831
1877	2,530	703,822	1880	492	204,604
1878	714	208,653	1881	2,910	769,186

While on the subject of importations, the volume of manufactured products in each of the past ten years will be shown in the following table, an interesting subject for study. In the second column will be found the importations of dress silks and in the third column the importations of ribbons, the two most important items in the silk import to this country :

Year.	Dress Silks.	Ribbons.	Year.	Dress Silks.	Ribbons.
1872	\$11,080,001	\$8,307,009	1877	11,978,135	1,689,413
1873	9,764,650	4,740,040	1878	11,834,931	1,829,838
1874	10,581,299	3,180,647	1879	15,104,026	2,180,260
1875	12,639,397	2,984,271	1880	17,665,038	3,563,848
1876	12,707,192	1,837,537	1881	16,959,043	2,614,918

The following table will show the value of silk and cotton mixed goods imported during the past decade and also the total value of all silk and silk mixed goods imported, including the articles enumerated above in detail. It may be worthy of note that more silk and cotton mixed goods have been imported than any other class of goods, either silk or silk mixed :

Year.	Silk and Cotton	All Classes	Year	Silk and Cotton	All Classes
1872	\$6,253,392	\$32,677,749	1877	\$1,992,033	\$19,922,741
1873	4,064,077	24,379,322	1878	1,981,899	20,042,730
1874	3,876,952	23,292,551	1879	2,652,228	25,830,829
1875	2,312,654	23,168,118	1880	4,751,946	33,305,460
1876	2,034,823	21,192,380	1881	4,267,394	31,626,377

It is worthy of note, too, that the total silk import from abroad is not greatly different in amount from the total value of the domestic silk product, which was \$29,983,650 in 1879, when the import was \$25,830,829, since which date the first-named has doubtless grown to an extent to keep it still in advance of the sum of the imports.

It is held by the best "silk authorities" that the finished product is on an average about double in value the cost of the raw material, which would give Paterson a total product in the above years as follows : 1872, \$9,556,700 ; 1873, \$6,977,264 ; 1874, \$5,217,616 ; 1875, \$7,162,948 ; 1876, 7,467,756 ; 1877, \$7,454,780 ; 1878, \$9,076,968 ; 1879, \$13,228,442 ; 1880, \$15,304,964 ; 1881, \$15,915,820.

There is another way to approach the desired end, and that is through the fragmentary records of the number of silk factories, looms, spindles, operatives, etc., given in various works of former years. Here again many difficulties arise, among which may be noted the great changes that have been brought about in silk machi-

nery, so that the number of spindles in motion, nor yet the number of looms running at different periods, convey little information as to the real status for purposes of comparison. For instance, when the number of looms is mentioned in the old records there is in many cases no indication as to their capacity—nothing to show whether they are hand or power-looms; and even if this were known the improvements have been so many and important within the past few years that the production of even power-looms has increased to a degree that would baffle any effort at comparison in this way. With the spindles it would be even more difficult and unsatisfactory, for, apart from the difference there may be in the size of the threads produced—organzine being one, two or three fibres to the thread, tram all the way from one to twenty—there is a difference of from 100 to 150, in some instances perhaps 200, per cent. increase in the revolutions of the modern over the old-time spindle. In the former years 3,000 to 4,000 revolutions a minute was perhaps the average rate of speed; now spindles, the Atwood and the Atherton, for instance, are run 10,000 and even 12,000 revolutions per minute. Even with the knowledge in possession as to the number of hands employed at different periods, we have still to remember that, with the vastly improved mechanical appliances, the volume of product to any given number of operatives must be far in excess of that of former years. Still, notwithstanding the unsatisfactory nature of such bases of estimation it may be well to furnish all possible data bearing on the subject and, taken together, a very good idea of the growth of the industry may be gathered therefrom.

According to the valuable paper on "Miscellaneous Industries" read at the Centennial meeting of the Paterson Board of Trade, as prepared by Dr. Charles Inglis, there were two silk factories in 1845, but no intimation is given of the product or number of hands employed. The census of Paterson for that year, by Rev. Mr. Fisher, though exceedingly full in all other respects, giving, as before, even the number of kine within the city limits, has not a word to say of silk operatives, silk mills or anything whatever to indicate that such an industry existed. This is a fair specimen of the thoroughness with which such matters have been dealt with in the past years.

It is found in the census of the city of Paterson published in 1857, in which even the number of cows and horses were noted, that there were at that time four silk factories, consuming 113,520 lbs. of raw silk per annum, running 4,966 spindles, and producing 100,520 lbs. of sewing and other silk. Nothing is said of looms for silk, though looms for cotton, flax, etc., are mentioned; and the number of silk workers given is but 23, a palpable error. There were at that time two dye-houses, and 22 dyers, but whether any were connected with the silk manufacture is not stated.

Bishop's History of American Manufactures, published in 1866, but giving the statistics for 1860, furnishes the following: number of silk mills in Paterson, four; operatives employed, 590; capital employed, \$153,000; annual product, \$846,500. It was estimated, however, that at the date when the book was issued, to wit: six years later, the above had increased to twelve establishments, 2,000 operatives and an annual product of \$2,000,000.

The Secretary of the Board of Trade, W. G. Scott, reported in May, 1874, that

at the commencement of the previous year there were in Paterson about 25 firms or corporations engaged in the silk manufacture in its various branches. Capital employed, about \$4,000,000 ; operatives, 4,000, about two-thirds females ; besides the indirect employment given to about a thousand others, in furnishing weavers' supplies, machinery, etc. The amount paid for labor connected with the silk industry was estimated at \$2,000,000.

Some idea may be formed of the correctness of the above estimates from the statistics of the silk industry of the State, as found in the Silk Association's report for the year ending December 31st, 1873 : Total number of operatives in the State, 3,406 ; amount of wages, \$1,139,485 ; amount of capital invested, \$5,497,416 ; value of product, \$5,615,983. At this time the total number of silk operatives employed in the country was given as 10,651 ; total wages, \$3,722,988 ; total capital, \$15,988,877 ; total product, \$19,894,874—a showing not greatly different from that of the volume of silk business in Paterson alone at the close of 1881 ; and yet this was but about eight years ago. At this time, according to the same authority, there were but 156 firms engaged in the silk manufacture in all its branches, including dyeing, in the country ; of these 30 were found in New Jersey, 61 in New York, 25 in Pennsylvania, 22 in Connecticut and but a few in each of some of the other States.

There is a further record, as to the time operatives were employed in different sections. In New Jersey they were employed 89½ per cent. of the usual hours of labor ; in New York 72 per cent. ; in Pennsylvania 88 per cent. ; in Massachusetts 96¼ and in Connecticut 93¼. The Silk Association's report for 1874 gives the number of silk operatives in New Jersey at 5,414 ; total in the country, 14,479 ; wages paid in this State, \$1,387,157 ; total in the country, \$4,497,319. At this time there were ten firms in the State engaged in dyeing ; hands employed, 174 men ; wages, \$87,458. In the whole country, 40 firms, 360 men ; wages, \$205,719.

The statistics of the silk manufacture of Paterson as published in Brockett's 'Silk Industry of America' in 1876, were as follows : Number of firms engaged, 32 ; dyeing establishments in addition to private dye-houses, 5—reduced to 4 in 1876 ; number of operatives nearly 8,000 ; proportion of female operatives about two-thirds ; proportion under 16 years of age, one-fourth ; amount paid in wages, \$2,664,993 ; capital invested, \$5,926,804 ; throwing spindles, 74,323 ; power-looms, 730 ; hand-looms, 563 ; braiding spindles, 23,445 ; pounds of silk dyed, 550,000.

In Secretary Franklin Allen's—of the Silk Association—report for 1876 he says that although the consumption of raw silk had fallen off, the country over, at least ten per cent. owing to the fluctuations in the price of raw silk and numerous strikes, yet in Paterson not less than \$2,000,000 was paid to operatives.

In Catholina Lambert's paper, read before the Paterson Board of Trade at the Centennial meeting, he represents the status of the silk industry as follows : Number of operatives, 8,000 ; amount of raw material used weekly, 9,000 lbs. ; number of ribbon manufacturers, 8 ; broad silk manufacturers, 6 firms, and about 150 hand-looms operated by weavers at their homes ; average wages of male weavers \$15 per week ; women and boys, \$7 ; hard silk hands, \$5.20 ; total production yearly about \$6,000,000.

According to the report for 1880 of the State Bureau of Labor and Statistics

published in 1881, the status of the silk industry in New Jersey was as follows in the years 1874, 1875, 1879 and 1880 :

	EMPLOYED.				Total.	Wages Paid.	Value of Production.
	Men	Boys.	Women.	Girls.			
1874	1,549	404	2,437	1,024	5,414	\$1,387,151	\$6,097,692
1875	2,349	748	3,902	1,382	8,381	2,963,993	10,930,035
1879	3,600	1,300	3,176	2,348	10,424	3,625,166	13,700,846
1880.....	4,852	1,488	4,965	2,275	12,680	4,168,335	15,808,424

The gap occurring from 1875 to 1879 has been explained elsewhere in this chapter. This report gives the average wages of men employed in the silk mills at \$1.79 per day ; women, \$1.01 per day ; boys and girls, 63 cents. The total product of manufactured silk in the United States in 1879 is stated at \$29,983,650, the proportion manufactured in New Jersey being given as 60 per cent., while all the other States of the Union together produced the remaining 40 per cent.

Below will be found the results of the canvass made in 1881, giving the status up to the close of that year. This, in connection with all the foregoing, will assist to a clear idea of the growth of the industry and afford reliable data not heretofore published and very valuable for future reference :

SILK MANUFACTURE.

Number of firms and corporations	93
Number of male operatives	about two-fifths
Number of female operatives	about three-fifths
Number of operatives under 16 years of age	about three-eighths
Total number of operatives	13,140
Amount disbursed fortnightly in wages	\$205,957
Amount disbursed per annum	\$5,354,882
Capital invested in mills, silk machinery, etc., about	\$14,500,000
Number of power-loom	2,960
Number of hand-loom	1,265
Number of throwing spindles	165,980
Number of braiding spindles	62,900
Square feet of flooring space occupied	645,600
Pounds of raw silk manufactured per annum	769,550
Value of finished product per annum	\$16,250,000
Horse-power employed	3,800

SILK-DYEING.

Number of firms in addition to private dye-houses	10
Number of men employed	975
Amount disbursed in wages per annum	\$625,590
Capital invested, about	\$490,500
Square feet of flooring space occupied	125,600
Horse-power employed	1,075
Number of pounds of silk dyed per annum	1,195,060
Value of product per annum	\$6,450,200

SILK MANUFACTURERS' SUPPLIES.

Number of firms	16
Number of hands employed	550
Amount disbursed in wages per annum	\$125,500
Capital invested, about	\$216,350
Square feet of space occupied	70,315
Horse-power employed	165
Value of product per annum	\$385,600

RECAPITULATION.

Total number of firms and corporations engaged in the silk manufacture and its dependencies	120
Total number of hands employed	14,665
Total amount disbursed in wages per annum	\$6,105,882
Total amount of capital invested	15,206,850
Total space occupied, in square feet	1,841,515
Total value of product	\$16,635,600
Total horse-power employed	5,040

No portion of the silk dyers' product enters into the above recapitulation, under the head of "total value," for the reason that it may be reasonably assumed that its value enters into that of the product as reported of the silk manufacture proper and therefore any account of it in this connection would be misleading. The statement of the Paterson dyers is to the effect that about half the silk they handle is on outside orders.

In closing this historic sketch of the silk industry of Paterson it is most gratifying to be able to say that the entire aspect betokens a thrift and prosperity never before attained. As we have seen, the pioneers and invincible promoters of the manufacture have encountered obstacles and discouragements of a nature and magnitude difficult for the later arrivals in the field to understand; but there is every warrant for entertaining hopeful anticipations respecting the future, there being little doubt that ample reward is in reserve for the plucky, intelligent and enterprising men who have surmounted such varied and stupendous difficulties.

Any community might well covet such an industry as the silk. The character and healthfulness of the employment and the grade of labor inseparable from its requirements classify it as one of the most desirable in the whole range of industrial pursuits.



CHAPTER XXXVII.

FLAX, HEMP AND JUTE.

THE pioneer in this branch of Paterson's varied manufactures was John Colt, who, in 1814, during the last war with England, began in Passaic Mill No. 1 to manufacture yarns and twines from American-grown flax. Three years later he added sixty hand-loom to the equipment and commenced to make flax sail-duck, selling large quantities to the United States Government. About 1824, when he began to manufacture sail-duck from cotton, he abandoned the flax staple, making the first yard of cotton duck in the world at the old "Duck Mill," at about this period.

In 1817 J. Vasques, or Velasquez, purchased the leases of the property now occupied by the Phoenix Manufacturing Company from the Paterson Bank, and entered upon the manufacture of linen sail-cavass, sail twines and flax-tow gunny-bagging. The mill had formerly been the cotton factory of John Parks. In 1821 John Travers was admitted as a partner, and the style of the firm was Vasques & Travers thereafter until 1826, when a charter was obtained and the Phoenix Manufacturing Company formed. The further history of this industry and its subsequent return from linen to cotton, in 1854, will be found recorded in the preceding sketch of the cotton industry in Paterson. It appears from the charter that the company was formed "for the sole purpose of manufacturing wool, cotton, flax, hemp and other articles of a similar nature." About 500 hand-loom weavers were employed at the factory and at their homes weaving sail-cavass. The production was very large.

In 1826 Chauncey Andrews applied a power-loom to weaving cavass, and very soon power-looms supplanted the more primitive machine; after this the work was confined more largely to the factory limits.

In 1844 the American Hemp Company was formed by some capitalists, mainly from Dundee and other parts of Scotland; hence the concern was known, informally, as the "Scottish Company." In February, 1846, the name was changed to

THE DOLPHIN MANUFACTURING COMPANY,

out of compliment to the sea-faring President of the organization, Robert L. Taylor.

John Taylor Johnston, a nephew, was named with Mr. Taylor in the act of incorporation, the others interested being merely denominated "their associates." Mr. Taylor was a Scotchman by birth, and was largely engaged as a broker in flax and jute in New York city. He owned fourteen lots on Spruce street near Oliver street, in Paterson, whereon the original mill of the company was built. Subsequently the company acquired additional land, including a strip with a frontage of 25 feet on Spruce street and extending back to Stony Road 588 feet. This was purchased from the Barbour Flax-Spinning Company a few years ago. With the original site valuable water rights were acquired, which are still retained.

The first Board of Directors of the Dolphin Company, in 1846, was composed of John T. Johnston, Robert L. Taylor, James B. Johnston, Charles A. Sherman and John B. Meldrum. The capital was fixed at \$150,000, with power to increase it to \$300,000, at the option of the directors of the company. The act of incorporation named thirty years as the limit of the company's existence, but a subsequent act has continued it.

John Taylor Johnston, formerly President of the New Jersey Central Railway, holds a controlling interest in the Dolphin Manufacturing Company, but is very seldom at the mill in Paterson. He is one of the busiest of men, being connected with vast enterprises of various kinds. He takes a deep interest in art and owns a magnificent art gallery in Fourteenth street, New York city, and is President of the Metropolitan Art Gallery, at Central Park. James Borman Johnston, a nephew of the late Robert L. Taylor, is an eminent New York lawyer, with an office in Wall street; he also has long held an interest in the Dolphin Company. Robert Johnston, another nephew, was for many years assistant superintendent at the Dolphin Mill with Superintendent J. B. Meldrum, and was burned to death in making an effort to save the fine organ from the flames at the time that St. Paul's Church was destroyed by fire, in 1848, not a vestige of his remains being found afterward.

The first superintendent of the company was John B. Meldrum, already referred to, a native of Dundee, Scotland, where he spun the first jute yarn made in that town, in 1832. The industry has since assumed vast proportions. In 1867 the total annual consumption of jute in Dundee was estimated at 60,000 tons; in 1881 more than 100,000 tons were manufactured. Mr. Meldrum was succeeded as superintendent at the Dolphin Mill, in 1867, by William Aitchison, also a Scotchman, and a skillful manufacturer, who had much to do with the origin of the industry, and who has grown old in the office of superintendent. He has now retired, his incumbency and salary being continued by the company in consideration of his long and faithful services, and John Cheyne, a gentleman of great experience in the industry, is nominally assistant, but really acting superintendent. Mr. Cheyne is a native of Dundee, Scotland, where he was assistant superintendent of the Camperdown Linen Works of Cox Brothers, at Lochee, a vast establishment that covers many acres of ground and gives employment to 5,000 hands. Ten years ago Mr. Cheyne came to this country and was employed as superintendent at the jute works of Nevins & Co., Methuen, Mass. In November, 1879, he came to the Dolphin Mill, where his skill and energy and the advanced methods introduced have already made a marked impression on the business of the company. At this mill the

late John Shaw was book-keeper from about 1854 to 1867, he having met with the accident that lost him his arm while working in the company's dye-house. The late Robert Hamil, also, was formerly a workman here; also John Hinchliffe, one of the firm owning the Eagle Brewery, and other well known citizens of Paterson.

The first line of product at the Dolphin Mill included hemp carpets, Brussels warp and filling, Venetian filling, rug warps, etc. The present product consists mainly in jute goods, hemp carpeting and "Napier matting," jute yarns, wrapping, wool and tobacco twines. The raw material is imported by the company direct from Calcutta, the jute plant being a tropical root of exclusively Oriental growth, mainly a product of India. It grows in marshes, like the rice plant, while flax and hemp, as is well known, grow only on upland and in cold climates. The jute plant attains a height of ten to twelve feet and much resembles the bamboo. The fibre is found in the inner bark, and is separated by maceration. Its first introduction into Europe as a textile is of comparatively recent date.

Previous to 1830 jute was scarcely known, except in the form of "gunny-bags," in which sugar, rice, pepper and other products of India had been constantly imported, without attracting special attention to the nature of the material of which they were made. When the raw fibre was first introduced its great length led to the impression that it would be useful for cordage, but on trial it was ascertained to be too much affected by moisture to be available for that purpose. But its capabilities for employment in such fabrics as matting and coarse carpeting soon became apparent, and its manufacture into bagging has been immense.

Almost every producing country now either imports "gunny-bags" or jute to make them, and this has reduced the price of hemp by taking its place and leaving the latter for more important uses. Jute can be bleached only with great difficulty; otherwise it would become an important component in the manufacture of paper.

Only inferior wrapping paper can be made from jute. It is imported in bales, usually weighing about 350 pounds, and in this shape it arrives at the Dolphin Mill, just as it is shipped from India. It is a brownish, hair-like substance, and apparently packed together without much system or preparation.

On thing that militates against jute manufacturers in the United States is the present tariff, which admits jute yarns at 25 per cent. *ad valorem*, while raw jute has to pay fifteen dollars per ton, which, on the present cost at Calcutta, is over thirty per cent., thus discriminating against domestic manufacturers to the extent of a duty of five per cent., while no home industry is protected. With jute admitted free, burlaps, which are used in such large quantities to cover flannels and other domestics, could be made at home for less than is now paid for the imported article. There would also be a good opening for export trade to the West Indies and South America, which is now almost monopolized by the English jute manufacturers.

The Dolphin Mill is the largest jute factory in America, and there are only one or two others, of a very small capacity, in the country. The Dolphin Company therefore has very nearly a monopoly of the business; and, as the manufacture requires great experience, large capital and years of time to get into successful operation, there is not much likelihood of serious opposition.

The processes of manufacture are very interesting. The jute is taken out of

the bales and passed through a machine that oils it, which makes it soft. It then goes through carding machines, and it is carded down gradually into rope-like strings. Then it is gradually spun down into threads, and in that shape made into warps or fillings, or into twine, as may be desired. The process, after the first one or two steps, is very similar to the manufacture of cotton, although it is not carried down so far. The character of the material does not admit of its being reduced beyond a certain degree of fineness.

It was the advance in the price of hemp, about 1846-7, that led to the jute manufacture by the Dolphin Company. Up to 1850, however, the consumption of jute for carpeting was comparatively trifling, but about that date Superintendent Meldrum introduced mottled goods by doubling and twisting different colored yarns together, which gave a pretty effect, and this imparted a new impetus to the manufacture, both in America and in Scotland, where, also, the idea was utilized. The Dolphin Company was the first to make tailors' canvass of jute entirely, instead of flax and tow, as formerly.

The principal product of the Dolphin Mill for the past four or five years has been a sort of floor carpet, known as "Napier matting," a substitute for cocoa matting. It is made not only of the natural color, but dyed in different hues and woven into attractive patterns. It is used for hall-ways, churches, stairs, aisles and the like. Great quantities of a wide sort of tape, that is used by upholsterers for the bottoms of chairs, sofas, etc., also are made; likewise immense quantities of twine, from the thickness used by shoemakers and grocers for tying up packages to the sizes employed to pack tobacco leaves, grain and for a thousand and one other purposes. There is but one other factory in the country, at Baltimore, Md., where "Napier matting" is manufactured.

In 1867, according to Bishop's "History of American Manufactures," the Dolphin Mill was 238x48 feet, two stories and an attic; the product was 100,000 lbs. of yarn monthly; 600 tons of jute were consumed per annum; 1,200 spindles and sixty looms were running, the machinery being all of the heaviest description, and the capital of the company was \$250,000. In 1869 an additional story was added to the entire mill, and this year the land, buildings and machinery were assessed at \$120,000. In 1876, according to John Swinburne, who furnished a paper on the "Flax, Hemp and Jute Industry," which was read before the Paterson Board of Trade in that year, the products of the Dolphin Mill since 1857 had "absorbed a yield of 3,000,000 lbs. of jute yarn; 420 hands were employed, and \$150,000 were paid annually in wages. During 1881 large additions were made to the works, by the erection of extensive buildings. The main additional structure is an immense factory of itself. It has 110 feet front on Spruce street by 200 feet in depth, and the larger part of it is three stories in height. A small portion in the rear is one story high, and in this all the power-looms are located, on account of the light. All the heaviest and most important machinery is placed in this additional mill, and the offices also are located in it. There is a large dining-room for the employes who bring their dinners, which will accommodate about 100 persons. This apartment is furnished with settees, and an arrangement of steam pipes upon which the employes place their kettles, so that their dinners will be kept hot. There is no arrangement or

convenience that could be thought of which has been omitted in the plans. Situated as it is between the two new and magnificent mills of the Barbour Flax-Spinning Company, the group constitutes as fine a collection of manufacturing establishments as there is in the city. There are at the close of 1881 600 persons employed in the establishment, whose wages aggregate about \$8,000 fortnightly.

The power of the mill is supplied by both steam and water. Besides the 180 horse-power turbine water-wheel, there is a steam-engine of 200 horse-power, supplied by three large boilers. This engine and the boilers are placed in a new engine-house located in the rear of the mill, and two more boilers, of steel, and another engine have been added recently. This is a compound engine, nominally of 400 horse-power, but capable of being run up to 600 horse-power if necessary. By an ingenious device used in gearing the engine acts as an assistant and governor of the water-wheel, so that the more water the less steam will be used, and it is so arranged that when the water is low the water-wheel can be immediately disconnected and the entire mill run by steam alone. The total power throughout the establishment is but little short of 1,000 horse. Men, women, boys and girls are employed in this establishment. The old part of the mill is a strong stone building, but the heavy looms in the upper stories make the floors to shake like a ship at sea in heavy weather. They have been shaking in this way for years. The floor beams are made to spring, which gives no jar to the outer walls, and in the opinion of many builders this arrangement is safer than solid floors. The building is crowded with machinery and hands, making it a veritable industrial hive. Eighty-six looms and 3,376 spindles are in motion here; total finished product, 4,144,748 lbs. per annum. Surmounting the tower over the new portion of the mill is a brass dolphin, a fitting figure to symbolize the company which for nearly forty years has carried on its extensive operations under the name of this queer deep-sea fish.

The present officers of the company are: John Sloan, President and agent; Herbert Johnston, Secretary and Treasurer; William Aitchison, superintendent; John Cheyne, assistant and present acting superintendent. The annual consumption of raw material is equivalent to 2,172 tons.

JOHN SWINBURNE.—JOHN SWINBURNE & CO.

In 1856 John Swinburne began to manufacture jute yarns, twines and cordage, and, later, gunny-bagging for baling cotton. The industry was started at the corner of Market street and Railroad avenue, whence it was removed to a small building in the rear of Todd & Rafferty's machine shop. A year or so later it was removed to Broadway, at the head of Bridge street, whence it was removed to the corner of Paterson and Ellison streets, where Mr. Swinburne remained for several years, admitting as a partner Robert Briggs, when the firm was styled John Swinburne & Co. They subsequently removed to a small factory of the Gun Mill group, and in 1873-4 to the Hope Mill, where the production was for a time quite large, aggregating 500,000 yards of bagging yearly, in making which from 500 to 600 tons of jute butts were consumed. Mr. Briggs retired about 1875, and soon after William

J. Swinburne, a son of the founder of the industry, was admitted, the firm being styled John Swinburne & Son from that date until the business was discontinued a year or two afterward, the manufacture ceasing to be remunerative. But meanwhile the firm purchased the Hope Mill and occupied the whole of it, about sixty hands being employed. The elder Mr. Swinburne has, since a date prior to the close of the business, and until quite recently, occupied the position of Cashier of the First National Bank.

J. C. TODD & CO.

This firm grew out of that of Briscoe & Ritchey, which had grown out of Furnival & Ritchey, who began the manufacture of jute twines and other goods about 1862-3 in a portion of the Phoenix Mill. Samuel Furnival was a gentleman of talent and some wealth; Michael Ritchey was a "graduate" of the Dolphin Mill, where he had worked twelve years, after which he became superintendent of Mr. Furnival's jute factory in New York.

The new concern was fairly prosperous and soon employed about sixty hands. In 1866 they began the erection of the brick factory at the corner of Jackson and Taylor streets, and when this was completed and occupied the business was greatly expanded. After a time the production of gunny-bagging from jute butts was begun. About 1870 Mr. Furnival sold his interest to James H. Briscoe, from Philadelphia, and removed to a factory in Brooklyn, where he continued his business. Briscoe was succeeded in the firm by Joseph C. Todd a year or two later, and since about 1872 the firm has been J. C. Todd & Co. In 1876 the mill was greatly enlarged, a two story storehouse, 28x125 feet being built. The annual product at this date was 750,000 yards of bagging; the annual consumption of material nearly 800 tons. Four years later another storehouse, two stories, 40x50 feet, was built, and the business steadily increased until, in 1881, more than 100 hands were employed, to whom \$50,000 was paid in wages, the production aggregated nearly 2,000,000 yards, and the annual consumption of jute reached 7,000 bales, of about 400 lbs. each. The raw material is imported direct from India, and the establishment is one of the largest in this branch in the country.

MESSRS. HAINES & DEAN began to manufacture jute goods in 1863, and the business was continued under various titles until about 1870.

HENRY L. BUTLER AND JOHN B. MELDRUM, the latter for many years superintendent of the Dolphin Mill, began the production of jute carpets in a portion of Furnival & Ritchey's mill, in Jackson street, about 1867. The carpets were painted by an ingenious process invented by Mr. Meldrum, the dyeing of jute having always been regarded as a difficult problem, and by some held to be impossible. A few

years later the firm removed to the Arkwright Mill, where the business was prosecuted with increased facilities, and here the manufacture was carried on with fair success. In 1880 the firm dissolved, and Mr. Butler leased the Brundred Mill at Haledon, where he continues the business. Recently he has discovered a red dye that promises to be a success in the production of these carpets, it being the first red that has ever proven effective to color the woody fibre of the jute.

The "Old Stone Mill," at Haledon, is an historic structure. Years ago it was occupied by M. H. Chapin as a silk factory, and at a much earlier date by Benjamin Brundred and others as a machine works. This business was commenced there in 1826. The mill was erected in the beginning of the present century for a powder works, and has since been occupied for a great variety of purposes, nearly or quite every leading industry having been represented at this ancient mill during the past three-quarters of a century.



CHAPTER XXXVIII.

THE BARBOUR FLAX SPINNING COMPANY.

THE industry prosecuted by this company in Paterson is one of the grandest in the city. However regarded, the great Barbour flax enterprise stands prominently forth and challenges the admiration and compels the respect of industrial America—and industrial Europe as well. It may justly claim a foremost rank on the score of age, it being now nearly one hundred years since the foundation was laid, as well as on the equally valid grounds of its extent, its utility and its beneficence.

Looking back through three generations, it is found that John Barbour, the father of the late William and grandfather to Thomas and Robert Barbour, well known citizens of Paterson, and the present directors of the American branch of the vast Barbour industry, about the year 1784 introduced into the North of Ireland from Paisley, Scotland, his native town, the manufacture of flaxen threads. John Barbour's establishment was very complete and quite extensive for that period, though the machinery was all run by hand or by horse-power. Upon the death of the founder his two sons, William and John, succeeded to the business, but after a few years of partnership, William withdrew from the firm and established himself at Lisburn, near Belfast, where he built the vast Hilden fire-proof flax mills, the most extensive devoted to this branch in the world. These are three great structures, besides many minor buildings—an industrial hamlet taken together—all beautifully located and surrounded by picturesque scenery. The central building is six stories high, and is provided with every appliance requisite for the prosecution of the immense manufacture. For nearly a century the industry has steadily expanded, and the hum of machinery has never ceased among the hills and valleys of old Ulster. The reputation of the Barbour threads widened until they were known to even the remotest corner of the civilized globe. A populous village sprung up about the works, comprising hundreds of neat and comfortable dwellings for operatives, churches, schools, post-office, dining halls and all that conduces to the well-being of an industrious community. The factory buildings proper cover twelve to fifteen acres of ground. The number of employes at Hilden and at a neighboring hamlet named Sprucefield, where a branch of the manufacture is carried on, aggregates from 3,000 to 4,000.

William Barbour admitted to partnership, at different dates, his five sons, John D., Samuel, Thomas, Robert and Frank, the firm being styled "William Barbour & Sons." In 1864 it was decided to establish an American branch, and Thomas Barbour, who had been much in this country as representative of the Irish firm, purchased Passaic Mill, No. 2, from the Colt estate, and, his brother Robert joining him, the firm of Barbour Brothers was formed and the Paterson enterprise inaugurated. The factory was rechristened and called the "Belfast Mill." Flaxen yarns and threads of all descriptions were manufactured, and the business expanded until, one after another, extensive mills were erected to keep pace with the requirements of the industry.

In 1865 the Barbour Flax-Spinning Company was formed, with Thomas Barbour President, which position he held until about 1875, when he resigned and was succeeded by Robert Barbour, the first-named being chosen Vice-President and Treasurer, having since that date general charge of all outside financial and other transactions at the New York office, while Robert has especial direction and oversight of the manufacture at the mills. The enterprise is one on both sides of the Atlantic, the Irish branch, or rather the parent establishment, which retains the old name, being under the direction of John D. Barbour, two of the brothers, Samuel and Frank, having died. Branch houses have been established at Boston, San Francisco, Montreal, St. Louis, Chicago and Philadelphia, and agencies in London, Manchester, Glasgow, Dublin, Paris, Hamburg, Brussels, Amsterdam, Madrid, Milan, Naples, etc., and branch agencies at Northampton, Knaeesebro and Stafford. The Barbours took the "grand prize of honor" of the Linen Section of Great Britain, at the Paris Exposition of 1878, the only *grand prix* given to Ireland, and the only one received by any thread manufacturer in the world. Medals were awarded at the London Exposition of 1862; Turin, 1868; Berlin, 1877; Philadelphia, 1876; Vienna, 1873, etc.

The three great mills of the company in Paterson rank among the first in the city, both as to extent and architectural merit. The factory wherein the industry was started was not, at first, very extensive; it was soon enlarged and other additions were built from time to time, but still more room was needed. In 1877 the erection of the Grand street mill was begun, the company having purchased the entire block bounded by Grand, Prince, Spring and Slater streets. This is not only one of the most imposing but one of the best and most thoroughly complete factory building in the State. It was scarcely finished according to the original plans when work was commenced on a large addition. The mill is now equivalent to a building 400x50 feet, three stories, with a vast chimney, an octagon in shape, nearly two hundred feet in height, an object that is among the first to strike the eye in approaching the city from almost any direction. The style of the whole structure is far more elaborate than is usually seen in factory buildings in this country, one of the first among American architects, the late E. J. M. Derrick, having been employed by the Barbours not only for this but for other erections. Within, the mill is a model of strength, safety and convenience. There is an air of wonderful solidity about every portion. Stone stairways are so enclosed by massive walls as to present a perfectly secure retreat in case of fire, though the entire premises are as



near to being absolutely fireproof as any building can well be made. The floors are of bluestone flags, ponderous wrought iron girders overhead in each of the three lower stories are supported by numerous columns, and sustain the massive brick arches on which the floors above are laid. On each floor is the best improved fire apparatus, automatic in character, to flood the whole building in case of fire, the fire itself being the agent relied on to set loose the innumerable streams that would soon drown it out, and which are made to flow when a certain degree of temperature is reached. The water which supplies the mills for this and other purposes is brought from the company's own water works, on Garret Mountain, out of reservoirs at least 200 feet above the level of the factory buildings; hence it has a powerful head and would be very effective in the extinguishment of a fire. Before these works were completed, in 1879, the Spruce street mill, wherein the American branch was sheltered at the first, was destroyed by fire, being involved in the same disastrous conflagration that laid in ruins a large portion of the Rogers Locomotive Works. This mill was rebuilt at once, and in a form that adds immensely to the appearance of that portion of the city. The two towers, one at either front corner of the new mill, are a notable and striking feature in looking down Oliver street from Main. The new factory is 50x180 feet in extent, four stories. Another vast structure, 405x48 feet in extent, three and four stories high, was completed in 1881. This is located at the corner of Grand and Morris streets, and is named the "Granite Mill," being built entirely of stone taken from the company's own quarries near at hand. The Spruce street, or "Lisburn Mill," being on the raceway, is run by both water and steam; the Grand street mill is furnished with a 500 horse-power (nominal) Corliss engine.

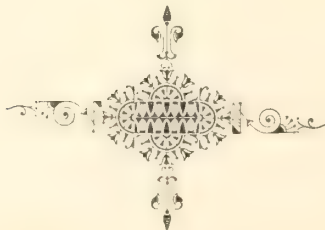
Every process in the manufacture of flax, every required manipulation from the field to the needle, is carried on at these mills. The company import the raw material from its native soil, and beginning with the "hackle" end with the spool. Dyeing, bleaching, spinning—all are done on the premises. The product embraces every variety of flaxen thread, such as shoethread of every size, for machine or hand sewing, ball and sail twine of various sizes, wrapping twines of divers colors, and fine linen threads for the manufacture of lace goods. The shoethread is made with extra care, so as to have a great and uniform strength, while free from all inequalities. It is perfectly smooth and even throughout; the Barbour shoethread is sought for in all lands, and no other made in the world has a like reputation. The total value of the product is about a million and a half per annum; upward of 1,000 hands are employed; the equipment consists in part of from 12,000 to 15,000 spindles. The Grand street mill cost nearly a half a million dollars to build; and in mills and houses for their work people, of which latter they own a whole block on Slater street, built of brick in the most substantial manner—the company have not less than two million dollars invested in real estate. As a company and as individuals the Barbour brothers are among the very heaviest tax-payers in the city.

Thomas Barbour is among the most public-spirited citizens of Paterson, and is found earnestly engaged in every enterprise for the advancement of the city of his adoption. He is a very large property owner in his own private right, outside the factory buildings, etc., of the company, his individual possessions including the

Watson Works and premises on Railroad avenue and adjoining streets—the entire block; lands in various suburban locations; a beautiful farm and residence at “Warren’s Point,” Bergen county (where he entertained General Grant and a distinguished party in a princely manner during 1880); also a fine residence in the city and “Brookside Farm,” at Preakness, a delightfully picturesque retreat nestled in the hills West of Paterson. Preparations were making at the close of 1881, by Messrs. Thomas Barbour & Son (William) for entering upon a vast enterprise in the manufacture of “harvesters’ twines,” a new industry.


Harvesters’, or sheaf, twine is made entirely of Kentucky hemp. The importance of this manufacture have been estimated from the following items: It requires one yard to a sheaf, and twenty sheaves to a bushel of wheat. There are raised in the United States 498,000,000 bushels of wheat. Of rye, oats, barley and rice the crop is as much more; so that at least \$5,000,000 worth of the sheaf twine will be annually required. This twine forms a great saving in binding sheaves, as in the best reaping machines heretofore expensive wire has been used altogether. With hemp twine wire is completely superseded. The sheaf twine will probably be made at the Granite Mill, and perhaps also at the Railroad avenue works.

According to the Board of Trade report on Paterson industries, published in 1874, the statistics of the flax, hemp and jute manufacture for 1873, were as follows: Production, \$1,748,000; wages of operatives, \$413,384; hands employed, 1,390. The status of the industry at the close of 1881, may be represented by the following figures: Total production per annum, \$2,450,000; number of hands employed, 1,650; total amount disbursed in wages, \$540,000 yearly.



CHAPTER XXXIX.

MISCELLANEOUS INDUSTRIES.

OME of the industries classed in this work under the head of "Miscellaneous" were developed in Paterson at a very early day and struggled through all periods of its history and under every discouragement, arising from variable and inadequate tariff laws and other adverse conditions, to become of leading importance. It was thus with the

WOOLEN INDUSTRY,

which was begun soon after the war of 1812 by John Clark, the elder, in a low frame building in rear of the Beaver Mill, where the carding and otherwise preparing wool for the fingers of early maiden spinsters of Paterson and vicinity was carried on for some time.

There is a tradition to the effect that there was a small and feeble effort at wool-carding several years prior to John Clark's beginning, but neither the name of this pioneer nor the location has been preserved.

John Flord is said to have made an attempt at the business of wool-carding and dyeing as early as 1812, on what is now West street.

It seems to have been difficult, if not impossible, at all times and in all places, to naturalize to any great extent the manufacture of two chief textiles in one locality, and Paterson has not afforded an exception to this rule.

In 1813 wool-spinning was carried on in a small way by John Tice in the Nightingale Mill. The fabrics were coarse, and were woven on hand-looms in private houses. The New York firm for whom Mr. Tice manufactured, subsequently purchased the Beaver Mill and drifted into the cotton business, and Mr. Tice removed to a very small mill near Little Falls, where he continued the woollen manufacture for a time, but not extensively.

The Holsman Mill was built by two Frenchmen, the Mallory Mill by John Travers, and the Harmony Mill by a Mr. Berry—all for the woollen manufacture. Each of these establishments followed the example of that at the Beaver Mill; Cotton was King.

Benjamin Bailey began to spin carpet yarns in 1846 and continued for many years, after a time adding the manufacture of coarse woolen cloth. The location was on the river bank at the head of River street.

Morrow's Mill, at Hawthorne, a Northern suburb of Paterson, was built in 1810, for a cotton factory. In 1824 it passed into the hands of the late John Morrow, who turned it into a woolen mill. After 1826 it was operated by Morrow Brothers and became a very important industry, the product being satinets, printers' and other blankets, paper-makers' felts and kindred fabrics. In 1859 it gave employment to 50 hands. Morrow Brothers were succeeded by Daniel Lowery, who in turn was succeeded by the original founder, John Morrow, and, after his death, his son Cornelius continued the business until it was transferred to Tingue, House & Co., who manufactured a fine class of woolen goods for several years, until 1875, when the mills were totally destroyed by fire, after which the last named firm removed to New England. The buildings were never replaced, and the site is still that of a ruin.

About the year 1832 the Messrs. Barrow engaged in the woolen manufacture, producing coarse "negro cloths" or kerseys and satinets, for the Southern market, on the site of the old Jackson & Maginnis Mill. Subsequently Messrs. Parkhurst, Lawton and after them Cutler, continued the industry in the same place and in a new mill, erected very near by. In 1842 the machinery was removed to the site of the present Waverly Mill, and for about ten years, up to 1852, E. B. Atterbury ran the factory, first on cheap union goods and later on excellent cassimeres and doeskins. For a while the enterprise was very successful, until the market was flooded with cheap foreign goods, which crippled and finally ruined the industry.

Robert Thompson came to Paterson from Kilmarnock, Scotland, and began the manufacture of ingrain carpets on the site now occupied by George Addy's mill, on Water street. He claimed to be the first to discard the old "barrel" method in making the figures on woolen goods, and to employ the Jacquard machine for that purpose. Mr. Thompson had his yarn spun at one time in Paul & Begg's mill, and later at the Old Red Mill, in Bergen County. The factory was destroyed by fire in 1835, but was rebuilt and leased to Higgins Brothers, of New York city, who continued the business until 1848, when another fire arrested the industry finally.

The Anglo-American Mill, at Haledon, formerly Brundred's, was purchased by the Messrs. Hodge, agents, in 1857, and a large business started, 300 to 400 hands being employed. The product was hosiery, stockinet cloth, for linings to rubber goods, merinos of a very superior quality, and other fabrics. The plant consisted in part of 3,000 spindles run on cotton and wool, producing 1,200 lbs. of merino yarns—mixed wool and cotton—per week; besides which large quantities were purchased. These yarns were woven on French and Belgian machinery into cloth for coats, gloves, shawls, dresses, counterpanes and stockings, 5,000 pairs of the latter being turned out weekly. The concern failed about 1860.

The latest woolen industry of note in Paterson was that of Solomon Bachmann, who leased the Hamilton Mill in 1868, and manufactured a fine grade of woolen and worsted shawls, skirts and other fabrics, including fine cloths and cassimeres. His English beaver shawl was a speciality, made in no other factory in the country

The mill was burned down April, 1877, and Mr. Bachmann removed the business to New England, where it has since been prosecuted, a mill with a full equipment of machinery being offered him on most favorable terms.

Maximilian Bachmann and Henry Laurent occupied a portion of the Franklin Mill for a time about 1866, in the manufacture of wool and "union" balmoral skirts and shawls. They were succeeded by Herman and Henry W. Bachmann, who continued the industry for a time and then drifted into silk.

Carpet-weaving has for many years been carried on by Robert Beattie, and Robert Beattie & Sons, his successors, at Little Falls, where three-ply carpets, fine rugs and many other goods are produced, pronounced to be equal to anything made in the country. This is an extensive and prosperous establishment and the only woolen industry of consequence in this section which has withstood the aggressive attitude and onward march, first of King Cotton, and, later, of Queen Silk.

THE IVANHOE PAPER MILL.

One of the most extensive as well as most interesting industries of Paterson is carried on by the Ivanhoe Manufacturing Company. The mill of the company, built of cut and dressed sandstone, with turretted towers, presents a very imposing appearance, and the establishment is among the most complete in the world devoted to the production of paper. All the buildings comprising the Ivanhoe group are fireproof and are models of factory architecture. They are thoroughly equipped with machinery of marvellous ingenuity and costliness. It is not easy to obtain admission within the precincts here, but the mysteries of manufacture once penetrated they leave one with a memory for a lifetime.

Henry V. Butler, the founder of this vast establishment, was born in Suffield Conn. in October, 1811. At the age of eighteen he was engaged as a clerk in a house in Pearl street, New York. He was a son of Asa Butler, who owned the Eagle Mill, at Suffield, where paper was made by hand, and who, in 1832, bought from a Mr. Morris, a steam paper mill in Cherry street, New York, on the site now occupied by the celebrated Hecker as a flour warehouse. About this date the son, Henry V. Butler, became a partner with his father, and at their mill the paper was made on which was printed the first number of the New York *Sun*, Moses Y. Beach, editor. At this mill, for the first time anywhere, paper shavings were utilized, being worked over into paper. Mr. Morris inaugurated this economy and the Butlers continued it. In 1833-4 the price of shavings had advanced from nothing to one cent a pound, while the finished product was sold at 12½ cents a pound. At this mill the first paper was made for the Philadelphia *Ledger*.

In 1837 the industry was removed from New York to Paterson, the manufacture being carried on in a firm and substantial stone mill, built for the especial purpose by direction of Roswell L. Colt. This was called the "Passaic Mill," and stood on the upper raceway on the site afterward occupied by the millwright shop of the Rogers Locomotive Works. It was furnished with two Fourdrinier machines, one

62-inch and the other 54-inch, of the most perfect construction then known. The product of the Passaic Mill soon gained a wide reputation and the foremost publishers in the country, including the American Bible Society, the Methodist Book Concern, the Appletons, Carter Brothers and others, were furnished with vast quantities.

The peculiar toughness and strength of the paper, which were notable features, is said to have been due to the use of old hemp rope, knots and cuttings from the cotton presses of the South, cotton waste from New England mills, etc., costing about one cent per pound. This rough and apparently unpromising material was first brought into use at the Passaic Mill, a peculiar picker or "devil" being set to work to tear in pieces and reduce to shreds the toughest knots with the same ease as other machinery shredded the plain rope. Contracts were made with the great Lowell and other Eastern cotton manufacturers and resident agents maintained to look after and ship to Paterson all waste of this character. The process of boiling stock under pressure in rotary boilers—a method which has since been universally adopted throughout this country and in Europe—Mr. Butler also introduced. Even the coarse sacking in which the cotton-waste and rags are baled, together with pieces of old rope and the like, are picked, cleansed, boiled and manipulated until they leave the mill at last in the form of the finest and whitest writing paper. The same rope that hangs a man will make the paper on which to write his obituary. Here the first super-calendered book paper ever manufactured was made. Peter Adams, a well known resident of Paterson, and for many years engaged largely in business in the line of paper-making, was foreman of the Passaic Mill, and afterward of the Ivanhoe Mill for the Butlers. Here, too, book paper was first put up into reams of 480 perfect sheets without using broken sheets as outside quires.

The business at the Passaic Mill proved a very profitable one, and from it was drawn a large part of the money required for the erection of the Ivanhoe Mill, which was completed and put in operation on the finer qualities of paper in 1850. In 1857, the lease of the Passaic Mill having expired, the capacity of the Ivanhoe Mill was increased and the first-named was abandoned. The firm at this date was styled H. V. Butler & Co., the "Co." being Robert H. Taylor, a famous New York ship-owner of large means, who knew nothing of and did not meddle with the paper-making business.

A writer in the *Scientific American* in 1859, stated as a fact that the Ivanhoe Mill, then nearly a decade old, had never stopped three days at a time, though running night and day. The product at this date was given as 35,000 lbs. of the finest quality of paper every week; number of hands employed 135. About this date the firm began making tub-sized writing paper, and soon the "Ivanhoe" brand became so widely known and so popular that the demand far exceeded the supply. In 1866 the firm was merged into the Ivanhoe Manufacturing Company, formed under a special charter, and from that date the business has been continued without change in this respect.

All this time there had been maintained in New York City a mercantile house in connection with the manufacture, but in 1868, the company not caring to continue this, Mr. Butler associated with him his son, Henry V. Butler, Jr., and the firm,

styled H. V. Butler & Son, began a commission paper trade at 62 Reade street, where all the Ivanhoe Company's business of purchasing and selling was transacted.

In 1871, the partnership of H. V. Butler & Son having expired by limitation, a new partnership was formed, the firm being composed of H. V. Butler, Jr. and A. Gibbs Campbell as general partners, and H. V. Butler, Sr., as special partner; the style was H. V. Butler, Jr., & Co., and the same line of business was prosecuted. A year later H. V. Butler, Sr., retired, and soon after died.

From the Paper-Makers' Directory is gleaned the following, which indicates the present status of the manufacturing department :

"Ivanhoe Manufacturing Company, Henry V. Butler, President; Ivanhoe Mill, Spruce street, Paterson, six 225 horse-power, and two 274 horse power engines; one 74 in., and one 84 in. Fourdriniers; product, water, writing, book and copying paper; amount, 7,500 lbs. every twenty-four hours."

At the mill the account is that the power consists of a large Boyden turbine water wheel 87 in. in diameter, giving over 200 horse-power, and two smaller turbines driving other portions of the machinery. The equipment is very complete and the product of infinite variety, as to thickness, quality, color, etc. Total annual product, about 2,600,000 lbs.

FLOCK AND WOOL EXTRACT.—JOHNSON & AUSTIN.

Among the most important of the miscellaneous industries of Paterson is the flock and wool extract factory of Johnson & Austin, on River street near Washington, one of the most extensive of its kind in the country. This establishment has grown from a small beginning made in the Spring of 1868 in the Union Works, Spruce street. John H. Chase, a native of Connecticut, together with two other gentlemen, named Williams and Billings, respectively, formed the "Union Manufacturing Company," and commenced to make "flocks" here. Very few hands were employed. In 1869 the company removed to the Bailey Mill, River street, where Mr. Chase put in one of his celebrated turbine wheels (his own invention), among the most effective known, and furnishing the maximum of power to the minimum of water. Here the number of hands was increased and the business expanded. A ten years' lease was taken and at the expiration of the term, in 1879, it was renewed for ten more years, with a privilege of purchase by the company at their option.

July 14th, 1879, the Bailey Mill together with its contents were almost entirely destroyed by fire, the company losing heavily. But the old buildings were immediately replaced by substantial brick structures, more extensive and much more sightly. By October the new factory was complete and operations resumed. Large additions to the works have since been made, including a fine three-story brick building erected in 1881. This is 100x65 feet in extent, and there are besides a building 110x62 feet, one story; another, 42x96 feet, two stories, and another, of frame, 55x50 feet, three stories. Here all the processes connected with this peculiar and interesting manu-

facture are carried on. The total flooring space aggregates about 50,000 square feet. The product at the close of 1881 amounted to upward of 20,000 lbs. per week, about one-third being flock and two-thirds extract. The first-named sells for from twelve to twenty-five cents per pound; the extract for from twenty to thirty-five cents.

After the removal to the Bailey Mill Messrs. John S. Richards and Pierrepont E. Johnson became associated with the three original founders of the enterprise, and the business was prosecuted by the five members of the company for five or six years with great success. Mr. Chase is rather a machinist than a manufacturer of flock and extract, but he was a most useful member and contributed much toward the success of the business, in the way of improved equipment, etc. Some years ago a reorganization was effected, and the three original members of the company retired, leaving Messrs. Richards & Johnson to continue, and, later, about 1879, Richards also retired and John T. Austin entered, since which no further changes in the proprietorship have taken place, and the business is steadily expanding in volume and importance under the firm name of Johnson & Austin, the company name being dropped.

Among the many errors which popular prejudice has caused intrinsic value to suffer from, that in reference to the manufactured materials known as wool extract and flock is perhaps the most unreasoning. Many suppose that these much-abused articles had their origin during the late civil war; but such is not the fact. Fifty years ago industries for their production were prosecuted in England, Germany and France. The remarkable cheapness of cloth for men's clothing, and other fabrics of late years is due chiefly to the use of these products, which are simply cloth and yarn reduced to a state that permits the use of the woolen portion of the material in the production of new fabrics, which is done in such a manner that they add greatly to their weight, and consequent value of the fabrics, and at a minimum of extra cost. The *Boston Commercial Bulletin*, in a recent issue, very justly asserts that the woolen industry of either this or foreign countries could not now be carried on without these valuable adjuncts, the quantity of substitutes for wool manufactured at the present time being estimated at 50 per cent. more than that of wool itself in the aggregate.

Flock is made of pure wool material, such as the trimmings from wool hats, and other trimmings, and it is introduced into the cloth in the fulling, being beaten through from the back of the fabric, after which the face is sheared with a "flock shears," leaving the surface or "nap" smooth and heavy. As thus used it is pure wool; there is no amalgamation of cotton. Extract is delivered ready for carding and spinning. It is the product of rags and shreds composed of part wool and part cotton, such as delaines and all "union" fabrics, the cotton being eliminated and the wool extracted by the use of chemicals; hence the term "extract."

At the works of Messrs. Johnson & Austin many tons of rags are worked up daily. The extract is utilized in the manufacture of delaines, jackets, hosiery, etc. Extract has been produced at this establishment since 1877, and the production is now the largest of any other establishment, and is regarded as of very superior quality. The dyeing is all done on the premises. About 100 hands are employed. Mr. Chase is in charge of the manufacture as superintendent.

THE SHIRT MANUFACTURE

is one of no small magnitude and is rapidly increasing. The pioneers in this branch of industry were Messrs. Sturgis, Perkins and Wilson, who came to Paterson from one of the Eastern States about 1855-6, and began to manufacture in a small brick building in River street, near Paterson street. Nearly ten years later Jacob Levi, who had been engaged in the business elsewhere, purchased the mill and equipment and succeeded the firm, making a very great success of the enterprise. After a time he admitted to partnership his brother, Louis Levi, and Morris Price, and in 1868 the firm built an extension to the mill, 25x100 feet, two stories, with basement. A few years later Mr. Price withdrew and Levi Brothers continued, and soon after built another large addition, one hundred and twenty-five feet in length, four stories high, and the business was greatly extended. During 1881 Jacob Levi retired from active participation in the business, leasing the mill and equipment to his brother Louis, and Benjamin Wechsler, who are still in possession. Another considerable addition was built to the mill in the Winter of 1881-2. The product has a wide range, including all grades and styles of shirts. Number of hands employed, about 350; amount disbursed in wages, \$150,000 yearly, besides a large amount to "piece hands" outside; capacity of factory, 12,000 to 15,000 shirts per week; total value of yearly product, about a quarter of a million dollars. This establishment is known as the "Manhattan Shirt Mill."

The "Sovereign Shirt Mill," on Broadway, is another large and important factory, occupied by M. Price & Brother, in the manufacture of shirts of all kinds. The location is at the head of Bridge street, adjoining the Excelsior Coffee and Spice Mills. Here Morris Price, upon withdrawing from the firm of Levi Brothers & Co., together with a partner named Markewitz, leased a substantial brick mill, and soon after another large building adjoining, both belonging to the estate of Josiah P. Huntoon. These buildings are three and four stories high, respectively, and their aggregate frontage is 65 feet, their depth 60 and 80 feet. Joseph C. Price entered the firm about five years after the business was started, Mr. Markewitz having previously retired. There are upward of 200 hands employed in the mill, besides large numbers who work at their homes, both in Paterson and in surrounding cities. The pay roll aggregates upwards of \$100,000 per annum, besides what is paid to outside workers; value of annual production, \$250,000; the number of shirts produced during the busy season will average 10,000 to 12,000 per week.

There are several other smaller establishments where shirts are manufactured, but these two great mills represent nearly all there is of the industry in Paterson.

PRINTERS' AND ENGRAVERS' MATERIALS.—VANDERBURG,
WELLS & Co.

Vanderburg, Wells & Co. are engaged in the manufacture of wood type and a great variety of printers' and engravers' material, such as, when referring to articles for printers' use, are known as "furniture." About 1859 the preparation of box-wood blocks for engravers' use was commenced.

This industry, first begun by the late Darius Wells, was continued and built up by Messrs. Wells & Webb, (Ebenezer R.) who formed a partnership about 1840, which was continued by them until 1859, when they dissolved, each prosecuting the business on his own account. At this date 12 to 15 hands were employed. The present firm, formed subsequently, is composed of Alexander Vanderburg, Heber Wells and Mary Lowe. The business has been greatly enlarged, until it is now an important industry. A portion of the manufacture is carried on in New York city, where three floors are occupied, at the corner of Fulton and Dutch streets, where much of the finishing is done. The factory in Paterson is in the Pope Mill, in Water street, North of the Main street bridge, to which the firm removed from the site of the Addy Mill in 1844. The industry is a peculiar and interesting one, the founder of the establishment, Darius Wells, having the honor of inventing the wood type now in common use; also the "routing" machine for cutting letters of any object in relief on wood, which has been greatly improved by John Royle & Sons, machinists.

THE TOBACCO MANUFACTURE.

Although the production of cotton goods was the principal object of the Society for Establishing Useful Manufactures, various other branches of industry from time to time claimed their attention, including that of tobacco, which, however, was soon abandoned; it was probably regarded as not precisely a "useful manufacture." The manipulation of the "world-subduing weed" was afterward extensively engaged in, and Paterson, in subsequent years, contained as many tobacco factories and did as large a business in this line as any city of its size in the country.

The oldest and by far the largest establishment in Paterson devoted to this branch is that of Allen & Dunning. This is an outgrowth of the tobacco factory of Stephen Allen, which was started a half-century ago. Later the business was conducted by Allen, Reynolds & Co., which firm was succeeded by the present existing one. For many years the business was carried on in the old Congress Hall building, at the corner of Market and Main streets, but was removed a few years since to Van Houten street, West of Main, where an extensive new factory was built for its occupancy. When the firm was Allen, Reynolds & Co., in 1859 and thereafter, 35 hands were employed. According to Dr. Charles Inglis' Centennial paper on "Miscellaneous Industries," 25 hands were employed at that date, 1876. The number has since been largely increased. The product has an extensive sale in Paterson and vicinity, and throughout a wide range of country, extending as far West as Chicago and Nebraska City. The goods of the firm are very popular the different brands being as familiar to chewers and smokers as "the commonest things in life."

Allee, Ackerman & Co., whose factory is at Caldwell, Essex County, and several other firms, also, are engaged in the tobacco manufacture. The cigar-making branch of the business is no longer confined to the large establishments but is distributed among numberless small shops and even to private houses in various parts of the city.

FLOUR AND FEED MILLS.

The manufacture of flour and feed was prosecuted a half-century or more ago by Albert and Jarvis Gurnee, veteran millers, who occupied a portion of the Waverly Mill site. But long before the Gurnees, near the close of the last century, Cornelius Van Winkle had a small grist mill on the river bank at the foot of Mulberry street, where he was succeeded by several others, until the mill was destroyed by the flood of 1810. The old grist mill and saw mill combined, on the site of the present Industry Mill, has been referred to elsewhere. This was established by Timothy B. Crane and run by him and his successors until about 1835.

John Bentley, whose extensive mill is located on the river bank, at the foot of Prospect street, may be regarded as the legitimate successor of those notable pioneers, the Gurnees. He has been engaged in the business for the space of about thirty years, or since 1852. He commenced in a small building which was a sort of adjunct to the Beaver Mill, and at first had but two run of stone. Four years later he removed to his present location, where he added to his equipment and built up a large trade, "Bentley's Mill" being known to all the farmers and others for many miles about Paterson. During the war Mr. Bentley's business was especially large; since the war there is not the same volume of custom, but there is a uniform operation that is satisfactorily remunerative. The mill is three stories in height and a model in every way, and the product, which includes flours of all kinds, and feed, is of superior excellence, Mr. Bentley being a most practical and experienced miller. The product will average from \$50,000 to \$75,000 in value yearly. The mill has now four run of stone.

The Passaic Mill, at the foot of Main street, is another extensive flour and feed grinding establishment, the business having been commenced by William C. Faatz and August Barnickel about 1869. This was the first steam flour mill in Paterson. Samuel C. Merrill succeeded the founders about 1870, and a year later the mill, a frame structure, was blown down in a tornado, but was at once rebuilt of brick, three stories. The mill has three run of stone.

MARBLE-CUTTING.

The business of marble-cutting has been prosecuted in Paterson by Benjamin Crane, senior member of the present firm of Crane & Son, for the space of nearly fifty-three years, which, probably, exceeds the record, in point of time, of any other establishment in this branch of industry in the State.

Benjamin Crane entered upon the business in a small way in the Spring of 1829. A few years subsequently the late Abram Garrison was associated as a partner, and the style of the firm for the space of twenty-five years thereafter was Crane & Garrison, when, through failing health, Mr. Garrison was compelled to retire and a son of the pioneer member of the firm was admitted to succeed him, the name being changed to Crane & Son, which remains unaltered to the present date.

During the more than half a century of the existence of this establishment great changes have taken place in the business, as in most other branches. Fifty-three years ago there had been no marble brought to Paterson for manufacture; very few marble head-stones and not a single marble monument of any kind had been erected in any of the city burying grounds, and for some time it was difficult to make the use of marble a success. The material then used for these purposes was mostly procured from the free stone quarries on the West side of the Passaic river, at Little Falls, and which has proved to be a remarkably durable material. A great many of these head-stones and monuments can be found in all the old burying grounds in the city and the surrounding country in nearly as good condition as when first erected, dirt and moss excepted, and in all probability they will continue so for an hundred years to come.

After marble had been used for a short time it was adopted almost entirely for cemetery purposes, but quite recently granite has come into vogue, especially for monuments. The great variety of designs and the wonderful skill brought to bear in execution renders the product of this art-industry as compared with that of fifty years ago very remarkable, and the changes and improvements in tools and the application of power and machinery in this as in other industries have revolutionized the entire business.

Besides the Messrs Crane, there are several others now engaged in marble-cutting and the preparation of building materials; among them William L. Bamber, who has an extensive establishment on Willis street, running through to Market, where the business was located first in 1848, after having been prosecuted since 1839 in upper Main street by the founder (the father of the present proprietor) the late David Bamber, who died February 7th, 1875. William L. Bamber entered the business in 1867.

THE PATERSON PRESERVING COMPANY

are pioneers in a branch of business of which they have a monopoly in Paterson. The canning of fruits and the preparation of pickles, preserves and sauces was commenced by the Reckhow Preserving Company in 1875, in West street. The business has grown to be of considerable importance, a large number of hands being employed and the most ample means and appliances used. The product includes everything in this department and is of such excellence that connoisseurs pronounce the sauces, pickles and other goods of the company equal to those from the world-famous Crosse & Blackwell's English establishment. A change occurred in the concern about the beginning of 1882 since which the name has been the Paterson Preserving Company.

SOAP AND CANDLE-MAKING

was begun in Paterson in 1846 by A. Worth & Co., who built up a prosperous business which was continued for many years, the product averaging 200 boxes of the former and 100 boxes of the latter per week.

The Boudinot Mill, Ellison and Straight streets, build by E. B. Atterbury in 1857, the first cotton mill in Paterson driven by steam-power, was changed to a soap works about the close of the civil war, when the cotton manufacture was no longer remunerative. Soap-making was carried on here until 1881, when the business was removed to the extensive new buildings erected for its occupancy at Riverside. The product is largely specialties for use in the silk and woolen manufactures. The establishment is known as the Paterson Soap Works, and the business is carried on by a stock company, of which George S. Atterbury is President and George Law is Secretary.

CHEMICAL FACTORIES.

The Elvin Chemical Works, at Riverside, is an extensive manufactory of acids, iron liquors and other chemical preparations used in dyeing. This business was formerly carried on in Rip Van Winkle avenue, and later at Weavertown, but during 1880 was removed to the present location where spacious new buildings were erected to accommodate the extended business.

Several other establishments, among them those of Barnes Brothers & Co., which was burned in 1881, and George Barnes, both at West Paterson, have been engaged in distilling pyroligneous acids, and compounding liquids used in printing and dyeing, for which products there is, naturally, much demand at the Paterson dye-houses. Of these George Barnes only is now prosecuting the manufacture, the production being from ten to twelve barrels daily, and at both Elvin's and Barnes' factories about twenty-five barrels.

COFFEE-ROASTING AND SPICE-GRINDING.

About 1840 Josiah P. Huntoon came to Paterson and established himself in a small way in the coffee and spice business, doing the grinding by hand. The enterprise was a success, and the result is seen in the extensive establishment on Broadway known as the Excelsior Coffee and Spice Mills, which are the largest in Northern New Jersey. The mills are run by steam and do a very heavy business.

Mr. Huntoon is a native of Montpelier, Vt., and at about 70 years of age is hale and vigorous still. He has a magnificent physique and a patriarchal appearance; he closely enough resembles the late William Cullen Bryant to claim relationship. Within a year or two past Mr. Huntoon retired from an active participation in the business, which is continued by Huntoon, Paige & Co., two of the partners being sons of the venerable founder.

Another considerable establishment engaged in this branch is that of John D. Haring, on River street, who has prosecuted the business for many years. There are several other establishments of minor note.

BEER-BREWING.

Brewing beer must be regarded as one of the important industries of Paterson, it being estimated that the aggregate product is at least 100,000 barrels yearly. The chief establishments are Graham & Co.'s "Passaic Spring Brewery," Shaw & Hinchliffe's (formerly Shaw, Hinchliffe & Penrose's) "Eagle Brewery," Katz Bros.' "Red Star Brewery" and the "Burton Brewing Company's," the last-named having commenced operations in December, 1881. Besides these there are the lager beer breweries of Sprattler & Mennel, Mrs. Christina Braun and one or two others of lesser note.

GRAHAM'S PASSAIC SPRING BREWERY,

in Hamburg avenue, is the oldest establishment of the kind in Paterson, but the place has been modernized and enlarged until it has grown entirely out of all resemblance to the quaint little snuggerly that occupied that location for many years. The extension completed in 1881 is a brick building, 80x24 feet, four stories high, with a cellar underneath that is equivalent to another story. The entire establishment is very extensive, the buildings being architecturally of pleasing appearance and, taken as a whole, a model of strength.

Under the greater portion of the buildings are cool cellars with numerous heavy supporting arches and stone-flagged floors, smelling sweetly of copious whitewash, and scrupulously clean. With exceptional facilities, in the way of equipment and appliances, so that excellent "present use" ale is made in an incredibly short space, reaching the barrels in a week after the malt is taken in hand, it is still impossible for Graham & Co. to keep pace with their orders. The entire product is absorbed by the Paterson trade. The capacity of the establishment at the close of 1881 was 650 to 700 barrels per week, but additional facilities in contemplation will soon increase this to 180 barrels per day, or about 1,000 barrels per week, which, it is estimated, will nearly supply the home demand. The total production for 1881 was in excess of 30,000 barrels; 19,000 barrels were made and delivered in seven months of the year. This is a larger business than was done at any other Paterson brewery, according to the Government internal revenue reports, and from the same authentic source it is ascertained that there are but two breweries in the State that exceed the establishment of Graham & Co. in their yearly production. The Government receives more than \$30,000 yearly in internal revenue tax on the manufacture. The wonderful success of this business, through the popularity of the product, is due to the care exercised to make a strictly pure article; "Graham's pure and unadulterated ale" has become as a household word in Paterson and its vicinity, the public having apparently become thoroughly convinced of its perfect freedom from all deleterious substances, and that it is a pure and wholesome beverage.

Joseph Hargreaves, who is in charge of the manufacture, is one of the most accomplished brewers in the country, and cleanliness, absolute and unquestionable, is a first law in his code. Another important factor is the pure, sweet water used,



which is supplied from a hillside spring at some distance. The cooling water is taken from deep wells on the brewery premises. None but Canada malt and the best hops and other material are used, and experienced men are employed in every department. All the barrels are made on the premises and are thoroughly cleansed each time they are returned empty. The principal product is "XXX" ale, which has attained a marvellous popularity; but "B" ale and "Dublin" porter also are made.

THE BURTON BREWING COMPANY began their first brew, at their new and extensive buildings on Straight street, December 22nd, 1881. The establishment is a model one in every respect. The company includes Judge Joseph R. Baldwin, President; Alpheus S. Allen, Treasurer, and Michael T. Evans, Secretary and inside manager. Mr. Evans, the brewer, was formerly in charge of the brewing department at the Eagle Brewery, and his great specialty is the production of "East India" pale ale, that, in the opinion of many, so closely resembles Bass' celebrated product it is difficult to distinguish between them. The secret of its manufacture was learned, it is said, by Mr. Evans in England under peculiarly favorable circumstances, his father being a famous brewer at Burton-on-Trent. The capacity of the establishment is from 800 to 1,000 barrels per week; the product consists of "B" and "XXX" ales, porter and brown stout, and "East India," the great specialty. About twenty-five hands are employed.

THE EAGLE BREWERY is located on Tyler street, and is a very extensive establishment, the product for 1881 being estimated at 30,000 barrels of ale and porter.

KATZ BROTHERS' BREWERY is in Bridge street. The product is very popular and the sales large, aggregating an average of 25,000 barrels per annum. The lager beer breweries, also, do a very large business.

SCREEN-PLATE MAKING.

About 1873 Henry V. Butler, of the Ivanhoe Paper Mill, and others, formed the Ashmun Screen-Plate Company, for re-cutting and repairing the costly brass screen-plates used to eliminate every particle of foreign matter and any inequalities from the macerated pulp in paper-making. Formerly these plates, which were imported at a great expense, were counted worthless when worn out, and were sold for old brass, but it is found that they can be re-cut for a comparative trifle. The company have been very successful. The business is altogether a specialty, and the secret of the methods employed are guarded carefully. The shop is in Van Houten, near Mill street.

THE ANNANDALE SCREEN-PLATE COMPANY was formed in 1876, for both making and repairing, ex-Aldermen Nathan Barnet and William C. Martin, and ex-City Clerk Robert A. Haley being the most prominently connected with the business. The shop is on Railroad avenue. This is the only establishment of the kind in the United States, with the exception of that of the Ashmun Company, which does re-cutting and repairing only. William C. Martin is superintendent. Very few hands are employed.

GEORGE ADDY.—A REPRESENTATIVE PATERSON MECHANIC.

George Addy is a well known and respected representative of the sturdy pioneers in industrial operations in Paterson. He is prominent also through his somewhat remarkable force of character and his wont of impressing himself and asserting his individuality whenever and wherever suitable occasion offers. No one can justly accuse Mr. Addy of trimming, of time-serving or of sailing with the tide, or moving with the multitude. On the contrary, he is almost certain to be found moving in the opposite direction. A man of strong convictions, sturdily honest in purpose, of prodigious energy, and a well-developed combativeness, he sets his face unflinchingly against whatever he conceives to be wrong in morals, religion, society, politics or any other department whatever. He is frequently found courageously leading a forlorn hope in most discouraging contests for what he, doubtless, thoroughly believes to be the right. Sometimes he wins, through sheer force of will and an utter refusal to know when he is beaten; oftener he loses the fight, as the impolitic and uncalculating, who are simply in dead earnest, are almost certain to do.

Mr. Addy has been very successful, however, in his business, and is among the largest property owners in the Second Ward, his possessions including the well-known "Addy Mill," recently enlarged to double its former size, and occupied for the silk manufacture by J. P. Mackay; also other property in that neighborhood, including about forty tenements in all. What Mr. Addy has that he can call his own he has earned by his labor and saved by his thrift. He came to this country from Yorkshire, England, landing in New York July 4th, 1849, without a dollar in his pocket. Being one of the third generation of a line of good blacksmiths, he had started in business at home, but did not succeed. He borrowed money to pay his passage to America and came almost direct to Paterson. Here he worked for George Archer, at the Danforth Works, and at the Rogers shop for about two years, when he commenced the business of screw and bolt-making in a little shop on Broadway. This was in 1851. Later he purchased land and established himself by the river bank, off Water street, where he soon built up an extensive business in making bolts, screws, smut-machines, mowing-machines, straw-cutters and other utensils. His shop is located in the lower portion of the Addy Mill.

For the first few years of his residence in Paterson Mr. Addy and his family lived in one room; then he built a shop with apartments overhead; ten years later he erected a brick house, and from that time to the present he has continued to invest in real estate and erect buildings, until he is now reputed to be worth from

\$60,000 to \$75,000, a proud achievement for a stranger coming to a new country without money and without friends; with only two good hands, his rugged Yorkshire constitution, his native energy, good sense and economy, and, above all, his indomitable will.

EDWARD RILEY'S DYE WORKS.

MURRAY MILL.

Edward Riley, who is a most accomplished silk-dyer, with a varied experience of twenty-one years in this and other countries, commenced business with a full and superior equipment of machinery and an ample force of skilled workmen, at the Murray Mill, Mill street, in July of the present year; hence the omission of the following sketch in its proper connection in the department of this work devoted to silk-dyeing.

Edward Riley is a native of Coventry, England, where, at the age of thirteen, he was regularly apprenticed for seven years to Messrs. Eld & Rotherham, who have one of the most extensive silk-dyeing establishments in England. Mr. Riley's father was superintendent of the vast operations at this works, and when, after the lapse of five years from the date of his son's apprenticeship, the elder Mr. Riley accepted a similar position in another large dyeing establishment, Edward accompanied him, remaining for about a year, when he was transferred to Nottingham and Derby, where he greatly enlarged his knowledge in all branches of the art of dyeing in its various departments.

In 1869 Mr. Riley came to America, and for a brief space was engaged in adding to his experience, after which he accepted the position of superintendent for the late Thomas N. Dale in his extensive dye-works at the Dale Mill, where he was in especial charge of the "black department." Later, when Jacob Weidmann succeeded to the control of the dyeing branch at the Dale Mill, which was operated thereafter on the commission principle, Mr. Riley remained as an associate with Messrs. Dale & Weidmann in the prosecution of the large business. Later still, when Mr. Weidmann commenced business on his own sole account, as elsewhere described, Mr. Riley was induced to attach himself to the new enterprise, remaining in full charge of the extensive and ever-increasing business of Mr. Weidmann for about nine years, or until January, 1882, when he retired from the position and, visiting England, added still more to his large knowledge of the peculiarly difficult business he is now prosecuting; the results of his sojourn abroad, during which he gained much insight as to foreign methods, of modern adoption, will be of incalculable advantage to him in his new enterprise, which has been inaugurated under the most favorable auspices. Already orders come pouring in from all directions; from Paterson mills and from establishments in other cities, Mr. Riley's reputation having long since extended far beyond the boundaries of the city of his adoption. Forty-five hands are employed, and this force will be greatly increased when the powerful patent boiler of 85 (nominal) horse-power, now being placed, shall be ready and afford an adequate supply of steam, the only element lacking.

Mr. Riley's extensive experience in all that pertains to silk-dyeing, his excellent connections among manufacturers, his genial and pleasant manner and his acknowledged natural ability, to which has been added an acquired skill second to no other in this department, would seem to ensure a brilliant future to the new establishment. His great practical knowledge will be brought to bear on every detail of the business, which will be under his personal and constant supervision.



PATERSON :

—ITS—

CORPORATE HISTORY,

—AND—

MUNICIPAL, EDUCATIONAL, RELIGIOUS, SOCIAL, POLITICAL,
FINANCIAL AND GENERAL FEATURES.

CHAPTER XL.

SKETCH OF CORPORATE HISTORY.

IN 1824 Paterson had a population of 4,787 ; in 1825 it had grown to 5,081 ; in 1827 to 6,236 ; in 1829 to 7,033, and in 1832, according to Rev. Dr. Samuel Fisher's census, it was 9,035. In the census for 1829, Dr. Fisher, who was pastor of the First Presbyterian Church, gives some other statistics of interest, as follows : Number of stores, dwellings, etc., 787, 30 of them unoccupied ; number of families, 1,220 ; number of children between three and sixteen, which was regarded then as "school age," 2,629 ; number of colored persons, 233 ; houses of public worship, 9, divided among the denominations as follows : Presbyterian, 1 ; Roman Catholic, 1 ; Methodist, 1 ; Reformed Dutch, 2 ; Episcopal, 1 ; Reformed Presbyterian, 1 ; Baptist, 1 ; True Reformed Dutch, 1. The foundations were laid for a large new Catholic church, but its location was not designated. The census thus classifies the families of the town as to their religious (or otherwise) leanings :

"With respect to religious profession, the heads of families, as far as ascertained, may be ranked as follows : Presbyterians, 335 ; Roman Catholics, 196 ; Methodists, 179 ; Reformed Dutch, Paterson, 129 ; Reformed Dutch, Totowa, 125 ; Episcopalians, 98 ; Baptists, 66 ; Reformed Presbyterians, 34 ; True Reformed

Dutch, 14; Reformed Dutch, of Aquackanonk, 7; Lutherans, 2; Independents or Congregationalists, 2; Friends, 2; Christian Baptists, 2; Universalists, 2; Unitarian, 1; Deists, 12; Nothingarians, 7; Atheists or Materialists, 2; Unknown, 5. Total, 1,220.

During the eight years from 1824 to 1832 Paterson nearly doubled in her manufactures and population.

In the year 1837 the county of Passaic was formed from portions of Essex and Bergen, and Paterson became the county seat. For a time the courts were held in the basement of the Cross street M. E. Church, but subsequently the present Court House and County Jail (the last-named has since been added to largely) were erected. This enhanced somewhat the importance of the town, but it was still regarded by New Yorkers and even by the people of Jersey City and Newark, as an up-country hamlet, chiefly noted for its fine waterfall and valuable water-power, with a mixed manufacturing population of little wealth and less refinement. In 1838 the population had reached 9,048.

About 1846 Paterson began to recover from the panic of 1837, and all her industries prospered, the cotton manufacture attaining its maximum importance between 1840 and 1845, in which last-named year the statistics given showed 1,208 dwellings occupied, 148 dwellings in process of erection; 2,000 families and a total population of 11,086. The churches had increased to 13; children of school age, 1,213; number of teachers, 30; lawyers, 11; judges, 10; justices, 17; circulating library, 480 volumes; another library, incorporated, 470 volumes; fire engines, 6; also a hook and ladder company; printing offices, 2.

During the year 1850, when the population had reached 13,969, great dissatisfaction existed in regard to the administration of township affairs, and as it was the opinion of many of the leading citizens that the Township Committee, consisting of Robert Morrell and E. B. Dayton Ogden, did not have power enough to enforce its authority, the advisability of changing the form of government from a township to that of a city was fully discussed, resulting, on March 19th, 1851, in the approval by the Governor of a bill passed by the Legislature granting a charter to the city of Paterson. Dr. Elias J. Marsh, ex-Governor Philemon Dickerson, William Gledhill, Robert Morrell, Daniel Barkalow, Dr. Charles Inglis, Jr. and E. B. Dayton Ogden were prominent among the citizens who obtained said charter. The original charter to the Society for Establishing Useful Manufactures made it necessary to carry with this movement the consent of the Society, which was readily obtained.

An election was held under the charter on April 14th, 1851, at which the following "Union" City ticket was elected: For President of the City Council, Philemon Dickerson, W.*; City Clerk, Socrates Tuttle, W.; Coroners, John Benson and John Vail; Chosen Freeholders, Garret A. Hopper and Joseph Gledhill; Surveyors of Highways, Josiah P. Huntoon and Peter Lydecker; Overseer of the Poor, John Avison. District Committeemen and ward officers also were elected from each of the three wards into which the city was then divided.

The first meeting of the Council was held at City Clerk Socrates Tuttle's office, on the South side of Congress street, No. 122, opposite Congress Hall, on Tuesday morning, April 22nd, 1851, at ten o'clock, at which were present, Philemon Dicker-

*W., Whig; D., Democrat; R., Republican; I., Independent.



son, President; Socrates Tuttle, Clerk; Committeemen:* Edward Clark, W., and John Schoonmaker, D., from the East Ward; Patrick Magennis, D., and Andrew Derrom, W., from the West Ward, and Jeremiah Stalter, D., and Charles Inglis, Jr., W., from the South Ward. The principal business transacted was the appointment of city officers. Edward Clark was appointed Treasurer, but declined, and Charles Inglis, Jr., was appointed in his stead. Col. C. W. Allen, W., was chosen Surveyor; William Gledhill, City Counsel; and Thomas Roe, D., Superintendent of Streets.

The Council met at the same place for some weeks, during which time the Finance Committee adjusted the amount of township debt, about \$23,000, to be assumed by the city, and provided for its payment by the issue of city bonds; afterward the Council met in Mrs. Cunningham's house, on the West side of Main street, next adjoining E. & H. Clark's hardware store, where they occupied the front and rear room on the second floor, until May 1st, 1855, when they occupied rooms in the old People's Bank building, meeting there until May 1st, 1870, at which time the city government was established in the building formerly occupied as a residence by Aaron S. Pennington, on Washington street, which had been purchased and fitted up for a City Hall, and is still occupied as such by the city. The total expenditure in 1851, outside the bond account, was \$4,500. The tax rate was one half of one per cent.

An amendment to the charter, March 25th, 1852, authorized the purchase of the first "Poor Farm." The expenditure this year reached \$7,948.41. In this year Colonel Allen entered on the first general survey of the city, and established grades. Following is a further record of the municipal government, including the formation of succeeding Councils and Boards of Aldermen, the election and appointment of city officers, appropriations each year, amendments to charter, etc., for the careful preparation of which valuable compendium the author is deeply indebted to City Treasurer Henry Ridgway.

ABSTRACT OF CITY GOVERNMENT.

1852-3.—Charles Danforth, W., President of Council; SOCRATES TUTTLE, W., Clerk; Committeemen: East Ward, John J. Brown, W., and JOHN SCHOONMAKER, D.; West Ward, James Nightingale, W., and ANDREW DERROM, W.; South Ward, Samuel Pope, D., and Nathaniel Townsend, D. Appointive officers: Samuel Pope, D., Treasurer; C. W. ALLEN, W., City Surveyor; WM. GLEDHILL, W., City Counsel; THOMAS ROE, D., Street Superintendent.

1853-4.—Andrew Derrom, W., President of Council; Richard B. Chiswell, W., Clerk. Committeemen: East Ward, Samuel Smith, D., and JOHN J. BROWN, W.; West Ward, JAMES NIGHTINGALE, W., and John D. Hogan, W.; South Ward, C. I. Westervelt, D., and Daniel Carpenter, D. Appointive Officers: C. I. Westervelt, D., Treasurer; John I. Goetschius, D., Surveyor; WM. GLEDHILL, W., City Counsel; John Blundell, W., Street Superintendent.

Act to incorporate part of Manchester Township, March 2nd, 1854, forming North Ward of city. Amendment to charter, March 9th, 1854, authorizing the appointment of a Comptroller; street improvements; construction of sewers; setting apart of school districts, and issuing of bonds for the payment of the cost of sewers.

* Ward representatives were for several years designated "committeemen."

† Names in italics are of those who held over; in small capitals of those re-elected; in roman of new officers.

1851-5. John J. Brown, W., President of Council; RICHARD B. CHISWELL, W., Clerk. Committeemen: North Ward, Cornelius A. Hopper, D., and Benjamin Getoe, W.; East Ward, Andrew Mead, D., and Henry Van Gieson, W.; South Ward, E. G. Ford, W., and C. C. Hopper, W.; West Ward, H. M. Low, W., and J. C. Todd, W. Appointive officers: J. H. GOETSCHUIS, D., Surveyor; H. M. Low, W., Treasurer; Henry Van Gieson, W., Comptroller; S. Tuttle, W., City Counsel; David H. Dorchius, W., Street Superintendent.

Amendment to charter, April 17th, 1855, authorizing the transfer of the property of the Paterson Fire Association to the city, and providing for the election of a chief engineer and two assistants; giving the city government power to open and lay out streets and avenues; also to form a new ward, to be called "the Fifth Ward of the city of Paterson;" to organize a Board of Education, and changing the title of President of the Council and Committeemen to Mayor and Board of Aldermen.

1855-6.—Brant Van Blarcom, D., Mayor; R. B. CHISWELL, R., Clerk. Aldermen: North Ward, Robert Fields, D., and George Zabriskie, R.; East Ward, HENRY VAN GIESON, R., and Henry Van Houten, D.; South Ward, Mayall Beaumont, D., and John O'Neill, D.; West Ward, Hiram Gould, D., and J. C. Todd, R.; Fifth Ward, John Edwards, R., and W. G. Watson, D. Appointive officers: J. C. Todd, R., Treasurer; HENRY VAN GIESON, R., Comptroller; H. A. Williams, D., City Counsel; J. H. GOETSCHUIS, D., Surveyor; Philip Van Bussum, D., Superintendent of Streets.*

Amendment to charter, March 6th, 1856, authorizing transfer of property from School Committeemen to the city, and an appropriation by Board of Aldermen to carry on schools for the current year.

1856-7.—Samuel Smith, D., Mayor; James Nightingale, R., Clerk. Aldermen: North Ward, Darius Wells, R., and George Zabriskie, R.; East Ward, P. J. Terhune, D., and Henry Van Gieson, R.; South Ward, MAYALL BEAUMONT, D., and John O'Neill, D.; West Ward, HIRAM GOULD, D., and J. C. Todd, R.; Fifth Ward, E. G. Ford, R., and W. G. Watson, D. Appointive officers: J. C. Todd, R., Treasurer; HENRY VAN GIESON, R., Comptroller; JOHN H. GOETSCHUIS, D., Surveyor; H. A. WILLIAMS, D., City Counsel; PHILIP VAN BUSSUM, D., Street Superintendent.

1857-8.—Peregrine Sandford, D., Mayor; Thomas A. Quin, D., Clerk. Aldermen: North Ward, Darius Wells, R., and Joel Beardsley, D.; East Ward, P. J. Terhune, D., and Henry Van Houten, D.; South Ward, Mayall Beaumont, D., and JOHN O'NEILL, D.; West Ward, Hiram Gould, D., and M. B. Murphy, D.; Fifth Ward, E. G. Ford, R., and Griffith King, R. Appointive officers: John O'Neill, D., Treasurer; J. H. Goetschius, D., Surveyor; M. B. Murphy, D., Comptroller; H. A. WILLIAMS, D., City Counsel; W. A. Gurnee, R., Superintendent of Streets.

1858-9.—PEREGRINE SANDFORD, D., Mayor; Chas. S. Day, R., Clerk. Aldermen: North Ward, Joel Beardsley, D., and Albert G. Van Dien, R.; East Ward, Henry Van Houten, D., and Allan Knowles, D.; South Ward, John O'Neill, D., and John Agnew, D.; West Ward, M. B. Murphy, D., and George Griffith, D.; Fifth Ward, Griffith King, R., and E. T. Prall, R. Appointive officers: Abram A. Fonda, R., Treasurer; George Griffith, D., Comptroller; H. A. WILLIAMS, D., City Counsel; J. H. GOETSCHUIS, D., Surveyor. Appropriations, \$72,018.14.

Soon after the municipal election this year John O'Neill resigned, and at a special election held in the South Ward in May, to fill the vacancy in the Board of Aldermen, John Cooke, R., was elected over William McAllister, D., and served to the end of the term.

1859-60.—Silas D. Canfield, D., Mayor; Wm. Davidson, Jr., D., Clerk. Aldermen: North Ward, Albert G. Van Dien, R., and Henry Hopper, D.; East Ward, HENRY VAN HOUTEN, D., and Allan Knowles, D.; South Ward, John Agnew, D., and Hugh Reid, D.; West Ward, George Griffith, D., and Adolphus Matthias, D.; Fifth Ward, E. T. Prall, R., and Edwin P. Parke, R. Appointive officers: Treasurer, Philip Rafferty, D.; Comptroller, GEORGE GRIFFITH, D.; Counsel, H. A. WILLIAMS, D.; Surveyor, JOHN H. GOETSCHUIS, D.; George Swift, D., Street Superintendent. Appropriations, \$67,854.

* The names of Superintendents of Public Instruction will be found in the sketch of educational system, to follow.

1860-61.—Edwin T. Prall, R., Mayor; Wm. Davidson, Jr., D., Clerk. Aldermen: North Ward, *Henry Hepper*, D., and Isaac D. Blauvelt, R.; East Ward, *Henry Van Houten*, D., and L. R. Stelle, R.; South Ward, Michael Harold, D., and *Hugh Reid*, D.; West Ward, *Adolphus Matthias*, D., and E. C. May, R.; Fifth Ward, Wm. F. Turner, R., and *Edwin P. Parke*, R. Appointive officers: *Philip Rafferty*, D., Treasurer; Edwin P. Parke, R., Comptroller; H. A. Williams, D., City Counsel; J. H. Goetschius, D., Surveyor; William S. Kelly, R., Superintendent of Streets. Appropriations, \$66,400.

1861-2.—E. T. Prall, R., Mayor; Daniel Miller, R., Clerk. Aldermen: North Ward, Samuel Brooks, R., and Isaac D. Blauvelt, R.; East Ward, L. R. Stelle, R., and Chas. E. Johnson, D.; South Ward, Michael Harold, D., and Patrick St. Lawrence, D.; West Ward, *Edward C. May*, R., and William Dobson, R.; Fifth Ward, *William F. Turner*, R., and Enoch J. Ayres, R. Appointive officers: John J. Brown, R., Treasurer (declined, and Philip Rafferty, D., appointed); Daniel Barkalow, R., City Counsel; David Burnett, R., Recorder; Horace O. Hedge, R., Comptroller; William A. Gurnee, D., Superintendent of Streets; Surveyor, no appointment. Appropriations, \$89,617.55.

(“UNION” TICKET).

1862-3.—Henry A. Williams, D., Mayor; Daniel Miller, R., Clerk. Aldermen: North Ward, *Samuel Brooks*, R., and P. Drew, D.; East Ward, *Henry Van Houten*, D., and *C. E. Johnson*, D.; South Ward, *Patrick St. Lawrence*, D., and Michael Harold, D.; Fifth Ward, *Enoch J. Ayres*, R., and Henry Harwood, R.; West Ward, *Israel Munson*, R., and William Dobson, R. Appointive officers: John Mortimer, R., Treasurer; Isaac Van Wagoner, R., City Counsel; *David Burnett*, R., Recorder; H. O. Hedge, R., Comptroller; David H. Doremus, R., Street Superintendent; Surveyor, no appointment. Appropriations, \$36,917.52.

Amendment to charter, February 2nd, 1865, authorizing the issue of \$40,000 in bonds to pay war bounties.

(“UNION” TICKET).

1863-4.—HENRY A. WILLIAMS, D., Mayor; George Magennis, D., Clerk. Aldermen: North Ward, *Giles Van Ness*, D., and *Peter Drew*, D.; East Ward, *Henry Van Houten*, D., and *Sherman Jaqua*, R.; South Ward, *Michael Harold*, D., and John J. Warren, D.; West Ward, *Israel Munson*, R., and William Taggart, D.; Fifth Ward, *Henry Harwood*, R., and George Porritt, R. Appointive officers: Patrick Curran, D., Treasurer; Andrew J. Sandford, D., City Counsel; *David Burnett*, R., Recorder; Nathaniel Townsend, D., Comptroller; William A. Gurnee, R., Street Superintendent; Surveyor, no appointment. Appropriations, \$92,770.30.

Amendment to charter, March 4th, 1864, authorizing the issue of \$135,000 in bonds to pay war bounties.

1864-5.—HENRY A. WILLIAMS, R., Mayor; Joseph R. Taggart, D., Clerk. Aldermen: North Ward, *Giles Van Ness*, D., and Jacob Rutan, R.; East Ward, *Sherman Jaqua*, R., and Halmagh Van Winkle, R.; South Ward, *John J. Warren*, D., and Bernard Murtagh, D.; West Ward, *William Taggart*, D., and Robert McCulloch, R.; Fifth Ward, George Porritt, R., and Charles S. Day, R. Appointive officers: R. B. Chiswell, R., Treasurer; D. W. Day, R., Comptroller; J. S. Barkalow, R., City Counsel; D. H. Doremus, R., Superintendent of Streets; John B. Van Blarcom, D., Recorder; Surveyor, no appointment. Appropriations, \$134,842.58.

Charter amended February 20th, 1865, authorizing the issue of \$340,000 bonds to pay war bounties.

Charter amended March 14th, 1865, authorizing the issue of \$136,000 in bonds to pay war bounties.

1865-6.—HENRY A. WILLIAMS, R., Mayor; Geo. W. Crocker, R., Clerk. Aldermen: North Ward, *Jacob Rutan*, R., and James H. Bush, R.; East Ward, John Reynolds, R., and *Halmagh Van Winkle*, R.; South Ward, William Killan, D., and Joseph E. Tynan, D.; West Ward, *Robert McCulloch*, R., and Peter D. Simonton, R.; Fifth Ward, *Charles S. Day*, R., and John Bowering, D. Appointive officers: R. B. Chiswell, R., Treasurer; Halmagh Van Winkle, R., Comptroller; J. S. Barkalow, R., Counsel; *John B. Van Blarcom*, D., Recorder; Cornelius S. Van Winkle, D., Superintendent of Streets; Surveyor, no appointment. Appropriations, \$185,723.96.

Charter amended February 20th, 1866, authorizing purchase of the present “Poor Farm.”

1866-7.—William G. Watson, D., Mayor; William P. Allee, D., Clerk. Aldermen: North Ward, *James H. Bush*, R., and *C. P. Gurnee*, R.; East Ward, *HALMAGH VAN WINKLE*, R., and *John Reynolds*, R.; South Ward, *William Killan*, D., and *Joseph Stansfield*, D.; West Ward, *Samuel R. Dean*, D., and *Peter D. Simonson*, R.; Fifth Ward, *John Backus*, D., and *William Atchison*, R. Appointive officers: *Patrick Church*, D., Treasurer; *HALMAGH VAN WINKLE*, R., Comptroller; *Andrew J. Sandford*, D., Counsel; *John B. Van Blarcom*, D., Recorder; *CORNELIUS S. VAN WINKLE*, D., Superintendent of Streets; Surveyor, no appointment. Appropriations, \$175,989.50.

April 4th, 1867, Act of Legislature authorizing the purchase or construction of Water Works, the purchase of ground for a public park, and the erection of market buildings, etc.

In July, 1866, first regularly organized police force appointed, consisting of ten men.

1867-8.—Henry A. Williams, R., Mayor; Archibald Henderson, R., Clerk. Aldermen: North Ward, *Joshua W. Cooper*, R., and *C. P. Gurnee*, R.; East Ward, *Halnagh Van Winkle*, R., and *Ezra Osborn*, R.; South Ward, *Joseph Stansfield*, D., and *John O'Brien*, D.; West Ward, *Samuel R. Dean*, D., and *Daniel Miller*, R.; Fifth Ward, *William Atchison*, R., and *Christopher McKiernan*, D. Appointive officers: *James Dunn*, R., Treasurer; *HALMAGH VAN WINKLE*, R., Comptroller; *John J. Warren*, D., Recorder; *John S. Barkalow*, R., Counsel; *David Stewart*, R., Street Superintendent; Surveyor, no appointment. Appropriations, \$208,497.29.

March 24, 1868, Act providing for the division in two wards each of the North, East and West Wards, and for designating the wards as the First, Second, Third, Fourth, Fifth, Sixth, Seventh and Eighth Wards, respectively.

1868-9.—Nathaniel Townsend, D., Mayor; Archibald Belcher, D., Clerk. Aldermen: First Ward, *C. P. Gurnee*, R., and *U. V. Munson*, R.; Second Ward, *Joshua W. Cooper*, R., and *Nathaniel Taylor*, D.; Third Ward, *Allan Knowles*, D., and *John B. Van Blarcom*, D.; Fourth Ward, *Ezra Osborn*, R., and *Samuel Smith*, R.; Fifth Ward, *John Wilkinson*, D., and *Christopher McKiernan*, D.; Sixth Ward, *John Murray*, D., and *Daniel Miller*, R.; Seventh Ward, *John O'Brien*, D., and *Joseph McNeill*, D.; Eighth Ward, *William Sweeney*, D., and *JOSEPH STANSFIELD*, D. Appointive officers: *E. R. Mason*, D., Treasurer; *Patrick Magennis*, D., Comptroller; *John J. Warren*, D., Recorder; *Andrew J. Sandford*, D., Counsel. *Robert Fields*, Superintendent of Streets; Surveyor, no appointment. Appropriations, \$283,013.16.

March 25th, 1869, Act providing for the purchase of Water Works, etc., as before provided in Act passed April 4th, 1867; and further providing that three commissioners be appointed by the Board of Aldermen to carry into effect such Act, giving said commissioners unlimited power to purchase or erect Water Works, purchase land for public parks, build market buildings, and issue bonds for the payment of same. The vesting of such unlimited power was viewed with alarm by several of the leading citizens, who obtained writs from Judge Bedle, at that time Circuit Court Judge, staying the proceedings, and bringing the subject before the Supreme Court, which decided that the City Government could not delegate powers which were only vested in them; also, providing for the creation of the Ninth Ward, embracing the boundaries described in the Act entitled "An Act to annex part of the Townships of Acquackanonk and Little Falls;" also, providing for the election of a Collector of Revenue.

1869-70.—John Ryle, D., Mayor; Archibald Henderson, R., Clerk. Aldermen: First Ward, *U. V. Munson*, R., and *C. P. Gurnee*, R.; Second Ward, *James V. D. Van Valkenburgh*, R., and *Nathaniel Taylor*, R.; Third Ward, *Peter Doremus*, D., and *John B. Van Blarcom*, D.; Fourth Ward, *Samuel Smith*, R., and *James Dunn*, R.; Fifth Ward, *John Wilkinson*, D., and *CHRISTOPHER MCKIERNAN*, D.; Sixth Ward, *DANIEL MILLER*, R., and *John Murray*, D.; Seventh Ward, *JOHN O'BRIEN*, D., and *Joseph McNeill*, D.; Eighth Ward, *William Sweeney*, D., and *Peter Kelly*, D.; Ninth Ward, *Christian Braun*, D., and *Jacob Koehler*, D. Appointive officers: *Edwin R. Mason*, D., Treasurer; *PATRICK MAGENNIS*, D., Comptroller; *Charles N. Taylor*, D., Collector of Revenue; *John J. Warren*, D., Recorder; *James Evans*, D., Counsel; *Robert Fields*, D., Superintendent of Streets; *John H. Goetschius*, D., Surveyor.

1870-71.—*John Ryle*, D., Mayor; ARCHIBALD HENDERSON, R., Clerk. Aldermen: First Ward, *U. I. Munson*, R., and *Henry Hopper*, D.; Second Ward, *J. V. D. Valkenburgh*, R., and *A. R. Van Houten*, R.; Third Ward, *John King*, D., and *Peter Doremans*, D.; Fourth Ward, *Alpheus S. Allen*, R., and *James Dunn*, R.; Fifth Ward, *Christopher McKiernan*, D., and *W. H. Carroll*, D.; Sixth Ward, *Daniel Miller*, R., and *George Griffiths*, R.; Seventh Ward, *John O'Brien*, D., and *Elias A. Vreeland*, D.; Eighth Ward, *Peter Kelly*, D., and *Michael Carlon*, D.; Ninth Ward, *JACOB KOEHLER*, D., and *Christian Braun*, D. Appointive officers: *JOHN J. WARREN*, D., Recorder; *EDWIN R. MASON*, D., Treasurer; *PATRICK MAGENNIS*, D., Comptroller; *Charles N. Taylor*, D., Collector of Revenue; *George S. Hilton*, D., Counsel; *James Doherty*, D., Superintendent of Streets; *JOHN H. GOETSCHUS*, D., Surveyor. Appropriations, \$412,800.

Charter amendment, March, 1871, providing for the division of the city into eight wards, their boundaries being described; defining legislative power of Board and executive powers of officers; establishing the present system of police; arranging the Departments of Finance, Public Instruction, Streets and Sewers, Charities and Correction, and Health; also the Fire Department; changing the title of Collector of Revenue to that of Receiver of Taxes and Assessments; regulating the salaries of city officers, prescribing time for their appointment, and of the passage of the Tax Ordinance, leaving the charter practically the same as in force at the present time.

1871-72.—*Socrates Tuttle*, R., Mayor; ARCHIBALD HENDERSON, R., Clerk. Aldermen: First Ward, *Henry Hopper*, D., and *Lewis L. Conklin*, R.; Second Ward, *A. R. Van Houten*, R., and *JAMES V. D. VAN VALKENBURGH*, R.; Third Ward, *John King*, D., and *Robert A. Smith*, R.; Fourth Ward, *W. W. Evans*, R., and *Alpheus S. Allen*, R.; Fifth Ward, *W. H. Carroll*, D., and *CHRISTOPHER MCKIERNAN*, D.; Sixth Ward, *James Ayres*, R., and *GEORGE GRIFFITH*, R.; Seventh Ward, *Thomas Campion*, D., and *Elias A. Vreeland*, D.; Eighth Ward, *Michael Carlon*, D., and *Peter Kelly*, D. Appointive officers: Same as in 1870, the Board being, politically, tied. Appropriations, \$513,284.30.

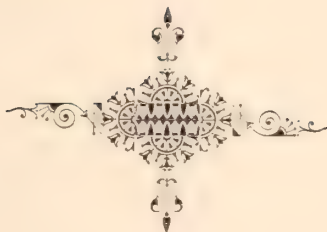
Owing to a disturbance in the Eighth Ward at the election in this year, which resulted in the ballot box going through the window of the polling place, no Alderman was elected from that ward, the vote of the ward being thrown out, and the Board of Aldermen was organized with fifteen members. The Republican members, under advice of counsel that eight members constituted a majority, organized the Board and appointed the city officers: *James Dunn*, R., Treasurer; *James Blundell*, R., Comptroller; *A. A. Fonda*, R., Surveyor; *Christopher Godden*, R., Superintendent of Streets; *G. A. Hobart*, R., City Counsel. The officers holding over refused to give place to those newly-appointed, and carried the matter to the Supreme Court, which decided that it required a majority of all the members to be elected, *i.e.*, nine, to appoint city officers. In the meantime the city affairs were in charge of two sets of officers. The Court also decided that *Peter Kelly*, the Alderman of the Eighth Ward whose term had expired, should hold over until his successor was elected and qualified.

1872-3.—*Socrates Tuttle*, R., Mayor; *Robert A. Haley*, D., Clerk. Aldermen: First Ward, *Lewis L. Conklin*, R., and *Henry Kimble*, R.; Second Ward, *A. R. Van Houten*, R., and *Frederick Gillmor*, R.; Third Ward, *Robert A. Smith*, R., and *Charles H. Calkins*, R.; Fourth Ward, *W. W. Evans*, R., and *John E. Dunning*, R.; Fifth Ward, *Charles D. Beckwith*, R., and *Christopher McKiernan*, D.; Sixth Ward, *James Ayres*, R., and *GEORGE GRIFFITH*, R.; Seventh Ward, *Thomas Campion*, D., and *David Stoddard*, I.; Eighth Ward, *Michael Harold*, D., and *William Powell*, D. Appointive officers: *James Dunn*, R., Treasurer; *William Swinburne*, R., Comptroller; *A. S. Allen*, R., Receiver of Taxes; *John J. Warren*, D., Recorder; *H. A. Williams*, R., City Counsel; *A. A. Fonda*, R., City Surveyor; *George Bunce*, R., Street Superintendent. Appropriations, \$530,200.

- 1873-4.—Nathaniel Townsend, D., Mayor; ROBERT A. HALEY, D., Clerk. Aldermen: First Ward, *Henry Kimble*, R., and William Cook, R.; Second Ward, *Frederick Gillmor*, R., and William Campbell, I.; Third Ward, Samuel B. Field, D., and *Charles H. Calkins*, R.; Fourth Ward, *John E. Dunning*, R., and John Swinburne, R.; Fifth Ward, *Charles D. Beckwith*, R., and John Bustard, R.; Sixth Ward, *George Griffith*, R., and JAMES AYRES, R.; Seventh Ward, *David Stoddard*, I., and John Quin, D.; Eighth Ward, *Michael Harold*, D., and Patrick Sweeney, D. Appointive officers: JAMES DUNN, R., Treasurer; WILLIAM SWINBURNE, R., Comptroller; A. S. ALLEN, R., Receiver of Taxes; JOHN J. WARREN, D., Recorder; JAMES EVANS, D., City Counsel; ABRAM A. FONDA, R., City Surveyor; George Bunce, R., Superintendent of Streets. Appropriations, \$576,500.
- 1874-5.—Nathaniel Townsend, D., Mayor; ROBERT A. HALEY, D., Clerk. Aldermen: First Ward, *William Cook*, R., and Hiram J. Smith, D.; Second Ward, *William Campbell*, I., and FREDERICK GILLMOR, R.; Third Ward, James W. Hewson, R., and Isaac Schoonmaker, R.; Fourth Ward, *John Swinburne*, R., and George B. Day, I.; Fifth Ward, *John Bustard*, R., and Joseph R. Graham, D.; Sixth Ward, *James Ayres*, R., and R. B. Morehead, R.; Seventh Ward, *John Quin*, D., and James Reilly, D.; Eighth Ward, *Patrick Sweeney*, D., and P. J. Dyer, D. Appointive officers: A. A. HOPPER, D., Treasurer; WILLIAM SWINBURNE, R., Comptroller; A. S. ALLEN, R., Receiver of Taxes; *John J. Warren*, D., Recorder; Henry A. Williams, R., City Counsel; A. A. FONDA, R., Surveyor; Richard Fielding, R., Superintendent of Streets. Appropriations, \$639,739.69.
- 1875-6.—Benjamin Buckley, R., Mayor; ROBERT A. HALEY, D., Clerk. Aldermen: First Ward, *Hiram J. Smith*, D., and Jacob Ryerson, R.; Second Ward, *Frederick Gillmor*, R., and William C. Martin, D.; Third Ward, *Isaac Schoonmaker*, R., and David Fullerton, R.; Fourth Ward, *George B. Day*, I., and S. S. Sherwood, R.; Fifth Ward, *Joseph R. Graham*, D., and August Fels, D.; Sixth Ward, *Robert B. Morehead*, R., and Robert McCulloch, R.; Seventh Ward, *James Reilly*, D., and JOHN QUIN, D.; Eighth Ward, PATRICK SWEENEY, D., and P. J. Dyer, D. Appointive officers: A. A. HOPPER, D., Treasurer; WILLIAM SWINBURNE, R., Comptroller; A. S. ALLEN, R., Receiver of Taxes; *John J. Warren*, D., Recorder; HENRY A. WILLIAMS, R., City Counsel; A. A. FONDA, R., City Surveyor; RICHARD FIELDING, R., Superintendent of Streets. Appropriations, \$553,313.34.
- 1876-7.—Benjamin Buckley, R., Mayor; ROBERT A. HALEY, D., Clerk. Aldermen: First Ward, *Jacob Ryerson*, R., and A. H. Van Wagoner, R.; Second Ward, *William C. Martin*, D., and William Campbell, D.; Third Ward, *David Fullerton*, R., and William M. Fortune, R.; Fourth Ward, *S. S. Sherwood*, R., and GEORGE B. DAY, I.; Fifth Ward, *August Fels*, D., and Joseph J. McNeill, D.; Sixth Ward, *Robert McCulloch*, R., and R. B. MOREHEAD, R.; Seventh Ward, *John Quin*, D., and William Ryan, D.; Eighth Ward, *Patrick Sweeney*, D., and Andrew McKenna, D. Appointive officers: JOHN H. WESTERVELT, D., Treasurer; WILLIAM SWINBURNE, R., Comptroller; A. S. ALLEN, R., Receiver of Taxes; JOHN J. WARREN, D., Recorder; HENRY A. WILLIAMS, R., City Counsel; A. A. FONDA, R., City Surveyor; RICHARD FIELDING, R., Superintendent of Streets. Appropriations, \$561,388.
- 1877-8.—BENJAMIN BUCKLEY, R., Mayor; ROBERT A. HALEY, D., Clerk. Aldermen: First Ward, *A. H. Van Wagoner*, R., and JACOB RYERSON, R.; Second Ward, WILLIAM C. MARTIN, D., and Joseph Lister, R.; Third Ward, *William M. Fortune*, R., and John W. Bensen, R.; Fourth Ward, *George B. Day*, I., and S. S. SHERWOOD, R.; Fifth Ward, *Joseph J. McNeill*, D., and AUGUST FELS, D.; Sixth Ward, *Robert B. Morehead*, R., and Nathan Barnert, D.; Seventh Ward, *William Ryan*, D., and JOHN QUIN, D.; Eighth Ward, *Andrew McKenna*, D., and John M. Powers, D. Appointive officers: JOHN H. WESTERVELT, D., Treasurer; WILLIAM SWINBURNE, R., Comptroller; A. S. ALLEN, R., Receiver of Taxes; *John J. Warren*, D., Recorder; H. A. WILLIAMS, R., City Counsel; A. A. FONDA, R., City Surveyor; Robert Bustard, R., Street Superintendent. Appropriations, \$484,517.62.
- 1878-9.—Benjamin Buckley, R., Mayor; ROBERT A. HALEY, D., City Clerk. Aldermen: First Ward, *Jacob Ryerson*, R., and A. H. VAN WAGONER, R.; Second Ward, *William C. Martin*, D., and John Swift, D.; Third Ward, WILLIAM M. FORTUNE, R., and *John W. Bensen*, R.; Fourth Ward, *S. S. Sherwood*, R., and Charles N. Sterrett, R.; Fifth Ward, JOSEPH J. MCNEILL, D., and William S. Taylor, R.; Sixth Ward, *Nathan Barnert*, D., and Samuel Murray, R.; Seventh Ward, *John Quin*, D., and WILLIAM RYAN, D.; Eighth Ward, *John M. Powers*, D., and John Murtagh, D. Appointive officers: JOHN H. WESTERVELT, D., Treasurer; WILLIAM SWINBURNE, R., Comptroller; A. S. ALLEN, R., Receiver of Taxes; *John J. Warren*, D., Recorder; H. A. WILLIAMS, R., City Counsel; John T. Hilton, R., City Surveyor; ROBERT BUSTARD, R., Street Superintendent. Appropriations, \$438,556.08.
- 1879-80.—Joseph R. Graham, D., Mayor; Will Hague, R., City Clerk. Aldermen: First Ward, *A. H. Van Wagoner*, R., and John Scheele, R.; Second Ward, *John Swift*, D., and William L. Munson, R.; Third Ward, *William M. Fortune*, R., and JOHN W. BENSEN, R.; Fourth Ward, *Charles N. Sterrett*, R., and Joseph W. Congdon, R.; Fifth Ward, *Joseph J. McNeill*, D., and William S. Taylor, R.; Sixth Ward, *Samuel Murray*, R., and NATHAN BARNERT, D.; Seventh Ward, *William Ryan*, D., and JOHN QUIN, D.; Eighth Ward, *John Murtagh*, D., and John Mallon, D. Appointive officers: Henry Ridgway, R., Treasurer; WILLIAM SWINBURNE, R., Comptroller; A. S. ALLEN, R., Receiver of Taxes; John W. Griggs, R., City Counsel; JOHN J. WARREN, D., Recorder; JOHN T. HILTON, R., City Surveyor; Richard Fielding, R., Street Superintendent. Appropriations, \$436,114.30.

1880-81.—*Joseph R. Graham*, D., Mayor; *Will Hague*, R., City Clerk. Aldermen: First Ward, *John Scheele*, R., and *A. H. Van Wagoner*, R.; Second Ward, *William L. Munson*, R., and *James Jackson*, R.; Third Ward, *John W. Bensen*, R., and *Andrew Elvin*, R.; Fourth Ward, *Joseph W. Congdon*, R., and *Charles N. Sterrett*, R.; Fifth Ward, *William S. Taylor*, R., and *James Johnston*, R.; Sixth Ward, *Nathan Barnert*, D., and *Samuel Murray*, R.; Seventh Ward, *John Quin*, D., and *William Ryan*, D.; Eighth Ward, *John Mallon*, D., and *James Keys*, D. Appointive officers: *Henry Ridgway*, R., Treasurer; *William Swinburne*, R., Comptroller; *A. S. Allen*, R., Receiver of Taxes; *John J. Warren*, D., Recorder; *John W. Griggs*, R., City Counsel; *John T. Hilton*, R., Surveyor; *Richard Fielding*, R., Street Superintendent. Appropriations, \$415,565.48.

1881-2.—*David T. Gillmor*, R., Mayor; *Will Hague*, R., City Clerk. Aldermen: First Ward, *A. H. Van Wagoner*, R., and *Isaac Van Houten*, R.; Second Ward, *James Jackson*, R., and *William L. Munson*, R.; Third Ward, *Andrew Elvin*, R., and *James Mills*, R.; Fourth Ward, *Charles N. Sterrett*, R., and *Joseph W. Congdon*, R.; Fifth Ward, *James Johnston*, R., and *Michael Campbell*, D.; Sixth Ward, *Samuel Murray*, R., and *George Van Wagoner*, R.; Seventh Ward, *William Ryan*, D., and *John Quin*, D.; Eighth Ward, *James Keys*, D., and *John Mallon*, D. Appointive officers: *Henry Ridgway*, R., Treasurer; *William Swinburne*, R., Comptroller; *A. S. Allen*, R., Receiver of Taxes; *John J. Warren*, D., Recorder; *John W. Griggs*, R., City Counsel; *John T. Hilton*, R., Surveyor; *Richard Fielding*, R., Street Superintendent. Appropriations, \$454,434.08.



CHAPTER XLI.

PATERSON IN 1882.

IN 1860, nearly ten years after its incorporation, Paterson had a population of 20,428, inclusive of the gain by the act of 1854, which added a portion of the township of Manchester to the city. In 1865 it was 24,893; in 1870, 33,579, and in 1880, 50,950. At the beginning of 1882 the population was estimated at 55,000. Its importance at this date may be shown by stating that the assessed value of the real property in the city in 1881 was \$16,952,258; of the personal property, \$3,657,787; total, \$20,609,545. Number of houses in the city, 7,144; number of lots, 59,259. The financial condition of Paterson may be illustrated briefly by the following comparative figures:

1875.—Resources, \$1,462,026.33; liabilities, \$1,459,058.47; surplus, \$ 2,967.86.
 1876.—Resources, \$1,493,233.24; liabilities, \$1,391,283.91; surplus, \$101,949.33.
 1877.—Resources, \$1,522,171.46; liabilities, \$1,350,173.72; surplus, \$171,997.74.
 1878.—Resources, \$1,623,463.08; liabilities, \$1,368,612.19; surplus, \$236,850 89.
 1879.—Resources, \$1,694,034.44; liabilities, \$1,397,472.08; surplus, \$292,562.36.
 1880.—Resources, \$1,742,161.26; liabilities, \$1,388,035.13; surplus, \$354,126.13.
 1881.—Resources, \$1,748,949.30; liabilities, \$1,328,907.11; surplus, \$420,042.19.

By these figures it will be seen that there has been a constant improvement in the financial condition of the city during the seven years from 1875 to 1881 inclusive, the balance in favor of the municipality having increased over \$400,000 in that period. The debt *per capita* of Paterson is less than that of any other large city in the State. That of Jersey City is about \$120; of Newark, \$60; Hoboken, \$35; Camden, \$28; Paterson, \$26. The credit of the city, owing to its excellent financial condition and economical government, stands very high in the money market, and what small amounts of Paterson bonds are offered from time to time are eagerly purchased at figures considerably above their par value, as desirable investments.

Paterson is, beyond question, the most attractive city in the State. Its situation is picturesque and its surroundings are unique. The configuration of the locality is very peculiar. The view from Garret Rock is simply matchless, and as the

EXPLANATIONS

SCALE 1500 FEET TO ONE INCH

RAILROADS.

HORSE RAILROADS.

LARGE FIGURES DENOTE WARDS.

8 $\frac{3}{4}$ MILES IN THE CITY.

5357 ACRES IN THE CITY.

SMALL FIGURES, FIRE ALARM STATIONS.

I, II, IV, ETC., LOCATION OF ENGINE HOUSES.

LATITUDE 40 55' N.

LONGITUDE 74 11' W.

ELEVATION ABOVE MEAN TIDE, 84 FT.



Map of the City of Waterson, N.J.

Revised by
Hilton and Menger, C.E. & Surs.
1882.



traveler approaches the city from the West by the Delaware, Lackawanna & Western Railway, which sweeps around the rocky base of the mountain at a high elevation, the whole city lies spread out like a map before him; also a wide expanse of country beyond, affording one of the finest panoramas in the State. The Passaic river, which, with its cataract, is the chief natural feature of the locality, contributes largely to the beauty of the scene. Entering the city from the Southwest, it pursues its devious course for a distance of about seven miles, through and around the city, dashing over the precipice at the Great Falls on its way, and urging its passage between the rock-ribbed perpendicular walls of grey trap below, until, regaining its peaceful aspect, it steals silently on, forming the boundary between Passaic and Bergen Counties for a considerable distance, and passing the city limit far toward the Southeast. Fourteen bridges, several of them very costly and handsome iron structures, span the river at different points within the city limits. These are known as the Lincoln, the Falls, the Chasm, West street, Main street, Bridge street, Straight street, the Erie Railway, the Midland (or, more properly, the New York, Susquehanna & Western, Railway), River street, Fifth avenue, Broadway, the Midland Railway, again, and the Market street bridges. The Falls bridge, which is of iron, is a single span more than 260 feet in length.

Few cities contain so many sites, within a few minutes' walk of the centre, commanding extensive and charming views, as Paterson. The abundant natural attractions of the city, together with the healthfulness of its situation, its economical government, excellent schools, its almost exhaustless water-power, ample facilities for transportation and its contiguity to overgrown New York, together with many other advantages that might be enumerated, all combine to assure the future of Paterson; it is, without doubt, destined to outstrip in relative growth and importance every other city of the State. It is interesting, active, thrifty and aggressive, and is fast taking rank with the brightest and most progressive of modern American cities. Though Paterson is not especially great architecturally considered, yet it can boast of a number of very creditable

PUBLIC BUILDINGS,

among which are the Court House and Jail, City Almshouse and County Lunatic Asylum (combined), the First National Bank, City Hall and Police Station, the Washington Market building, with its spacious hall; St. Joseph's Hospital, the Ladies' Hospital, the Protestant and Roman Catholic Orphan Asylums, the former built and furnished by the proceeds of the greatest fair ever held in the city; the Paterson Opera House, built by John Walden; several excellent hotels, besides which there are a number of very fine private buildings for business purposes, including numerous imposing mill structures; also churches, schools, etc., several of which will compare favorably with those of any other city of its size in the country. Of handsome private residences, also, there are a large number, to be found mainly in that portion of the city lying East of Main street. Among the "modern improvements" of the city is an excellent telephone system, which is most liberally patronized, not only for local communication but for the transmission of messages

to New York city and to all other contiguous cities and towns. The system is already very comprehensive and is being rapidly extended. An electric burglar alarm and messenger service has recently been established, the first-named feature for the better security of the valuable contents of the numerous mills. There are three lines of street railways, one connecting the locomotive shops with the Erie Railway to facilitate the transfer of locomotive engines ; the Paterson and Passaic Horse Railway Company, organized in 1868, running cars on three routes through the city, and the Paterson City Railway Company, organized about the same date, running cars on four different routes.

The police force of the city, which is very efficient, consists of forty-three members, officers and men. The officers are : Chief, Frederick G. Gaul ; Captain, John Bimson ; Sergeants—Henry Barclay, James Hewitt, Michael Keefe and John McBride. The force was nearly doubled during the year 1880 ; prior to that date it consisted of but twenty-four members. In

THE FIRE DEPARTMENT

are about 900 members, belonging to thirteen companies, eight of which are in charge of steam fire-engines of the second and third classes ; three are hook and ladder companies, and two are hose companies. The present officers are : Chief Engineer, Leonard Garrison ; First Assistant, James Kearney ; Second Assistant, Daniel Leonard. Several of the engine houses are very tasteful structures. The further equipment of the department consists in part of about 12,000 feet of the best rubber hose, and a supply wagon to attend with extra hose, etc., at fires. The electric fire-alarm system is one of the best and most efficient character, and under the skillful management of Superintendent James F. Zeluff is an important factor in the protection of the city from fire. There are thirty-seven miles of wire, forty-two boxes whereat to give alarms, five bell-strikers in various towers, and fourteen gongs. The system is controlled by a Hill's gravity battery of 200 cells.



CHAPTER XLII.

THE PASSAIC WATER COMPANY.

AN old charter, granted for the formation of a "Passaic Water Company" as early as February 13th, 1849, was in 1854 resuscitated, and the present company was formed under legislative enactment, the bill being approved February 9th, 1854, with Thomas D. Hoxsey, John J. Brown, Cornelius S. Van Wagoner, John Drew and Samuel Smith incorporators. Of the \$100,000 in shares of stock issued, John Ryle took about \$75,000. The books were opened at Judge Van Wagoner's office, in Market street, the present site of the Masonic Hall. For the first few years the water was pumped up to what is now the lower reservoir—there was then no other—from the river at the Gun Mill; about 1860 or a little earlier the works at the Falls were commenced, and the pumping station was removed to its present location in 1862. The late General Thomas D. Hoxsey was the first engineer of the works. The first reservoir was built by John Garside, under the direction of John Ryle. The motive power for pumping at the Gun Mill was supplied by the powerful water-wheel that run the machinery, the pumping being done each night. Auxiliary power, in times of drought or special need, was furnished by a beam engine that stood where the blacksmith shop of Benjamin Buckley was afterward built. The suction pipe used in pumping extended to the river at the quarry, in the rear of the mill. The first pump used was built by Morris & Co., of Philadelphia, and was placed near the engine at the Gun Mill. The pumping main crossed the river on a bridge constructed from the Gun Mill dye-house to the Valley of Rocks; thence it extended up a chasm near the Easterly end of the lower reservoir. This bridge was carried away by the ice in February, 1867, and thereafter the pipes were laid across on the river's bed. Water was first turned on for use in that portion of the city South of the river in the Autumn of 1856, and in the Northern portion, then called the North Ward, October 30th, 1857. This supply was carried across the bridge at the foot of Main street. In March, 1857, the first city hydrants were being placed. The middle reservoir was built and used in 1868; the Totowa reservoir in 1872. The pumping was done entirely by an immense turbine wheel until 1878, when a duplex Worthington steam pump was added, and in 1880 the pumping capacity was further increased by the addition of a

powerful steam engine. The total pumping capacity of the works, which was greatly increased in the Spring of 1882, is estimated at 18,000,000 gallons in twenty-four hours, there being an aggregate of about 400 horse-power at command. The maximum daily consumption of water by the city in 1881 was 6,000,000 gallons, or about 115 gallons *per capita*. The capacity of the reservoirs, according to L. B. Gardiner, hydraulic engineer, who made a careful examination of the works in 1880, is as follows: Totowa reservoir, 829,000 gallons; middle reservoir, 10,779,000 gallons; lower reservoir, 6,552,000 gallons; total capacity, 18,160,000 gallons. The Second and a part of the Eighth Wards are supplied from the first-named; the Fourth, Fifth, Seventh and the rest of the Eighth Wards are supplied from the middle reservoir; the First, Third and Sixth Wards are supplied from the lower reservoir. It is in contemplation by the company to greatly enlarge the storage capacity by an additional reservoir, to be built in the near future. The capacity of the forebay, or pumping basin, was estimated by Mr. Gardiner, in 1880, at 4,100,000 gallons, gross, but vast improvements were afterwards made by the removal of rocks, etc., and the completion of a strong dam at the very brink of the precipice at the Falls, so that the capacity is greatly increased. With additional flashboards on this dam, to be erected when necessary, the capacity will be at least quadrupled as compared with the estimate made in 1880. There are more than forty miles of street pipes connected with the works, ranging in size from six to twenty inches in diameter. The number of fire hydrants supplied exceeds 500.

The directors of the company in the Summer of 1881 were: John Ryle, John J. Brown, William Ryle, John Shaw, William T. Ryle, all of Paterson, and William H. Fogg and Harold F. Hadden, of New York city. Of these, two, William Ryle and John Shaw died within the year. The officers of the company are: President, John Ryle; Treasurer, John J. Brown; Secretary, John C. Ryle; Superintendent, William Ryle. The last-named, who is a relative of the above-mentioned William Ryle, deceased, has been Superintendent since 1871, and through his energy and efficiency has contributed much toward the great improvements made in the past few years. The plans, drawings and superintendence of the works were all his. John Ryle has been President of the company for very many years, and it has been largely owing to his public spirit and wonderful enterprise that Paterson may boast of one of the most complete systems and best equipped water works in all this section of the country, the supply being ample and assured for all purposes and under all circumstances.

A brief space should, perhaps, be devoted to a description of the respective rights and privileges of the Society for Establishing Useful Manufactures and the Passaic Water Company, which were long in dispute. The dam, as constructed in 1838-40 by the Society, remained in the same condition until 1864, when three feet in height was added at the top, in part of stone and part of wood (the wooden portion known as flashboards) to back a still greater volume of water toward the opening gate into the raceway trunk. This afforded the Society a greater facility for depleting the river and, of course, kept back the water from reaching the pumping station of the Water Company. Legislative power was acquired in 1868 to maintain this additional height, but the Passaic Water Company claiming, as an offset to the in-

terference with the flow of the river, openings in the original dam, below the coping, six inches in width by eight feet in length, this was finally conceded by the Society. Also, there are three gates above the coping, each six inches in width, four feet in length, equivalent to an opening six inches by twelve feet in all, that are to be opened under certain conditions. The whole arrangement may be summed up thus : First, if there is not an inch of water running over the top of the dam (flash-boards) then the three upper gates shall be opened at night. Second, if the flow through these is not full and ample then the lower gate, in the original dam itself, below the coping, may be opened—also at night, and on Sundays.

SANITARILY CONSIDERED,

Paterson has much to boast of, although her good name in this regard has been attacked from time to time in the columns of sensational New York city and other newspapers with a mendacity that is difficult to account for. The exhibits of the Bureau of Vital Statistics, when compared with those of other cities, furnish abundant refutation of the charges of insalubrity, and more especially when it is considered that Paterson, as a manufacturing city, naturally attracts to itself a large number of a class not usually the most careful to preserve those conditions conducive to health. According to the statistics of the above-named bureau, carefully prepared by Registrar George Boyd, the rate of mortality in Paterson has been as follows in the years named, the reports covering from March 29th to April 1st, in each instance : 1878-9, 18.8 ; 1879-80, 21.5, and in 1880-81, 23.3 deaths per thousand inhabitants per annum. Compared with other cities, even those which have not a manufacturing population, this rate is not excessive. The annual mortality per thousand inhabitants, as computed from the monthly death rates published in some other well known cities, is as follows : New York, N. Y., 34.6 ; Brooklyn, N. Y., 24.6 ; Buffalo, N. Y., 26.5 ; St. Paul, Minn., 22.5 ; Milwaukee, Wis., 19.3 ; Chicago, Ill., 31.1 ; Vicksburgh, Miss., 30 ; Bismarck, Ga., 36 ; Fall River, Mass., 25.2 ; Philadelphia, Pa., 22.9 ; Newburgh, N. Y., 28.2 ; Camden, N. J., 27.5 ; Orange, N. J., 27 ; Hudson County, N. J., 37. James W. Ensign, a citizen of Paterson who, from being engaged in the business of undertaking for many years, has been led to pay much attention to mortuary statistics, furnishes figures as follows : Rate of mortality in Paterson from May 31st to June 1st, 1879-80, based on a population of 50,950, 22.06 per thousand ; rate for a like period in 1880-81, based on a population of 52,500, 22.8 per thousand.

Through the efforts of the present excellent City Physician, Dr. Charles F. W. Myers, and the very efficient Assistant City Physician, Dr. William S. Hurd, together with the intelligent and valuable co-operation of City Surveyor John T. Hilton, Leslie S. Menger, the engineer in charge of sewer construction and drainage, and other active and capable city officers, the sanitary condition of the city has been greatly improved and is constantly improving. To the advantage of excellent natural grades has been added a thorough system of sewers, which is being extended yearly. The health of the city is a subject that is receiving the fullest attention at the hands of the municipal government, and wholesome ordinances have recently been passed bearing

thereon. Dr. Meyers, who is a graduate of the New York College of Physicians and Surgeons, is young, energetic and especially active in promoting, in every possible way, the health of the city, and, having made the subject of sanitary conditions, the laws of health and the origin of diseases a close study, is doing an invaluable work in his department. Dr. Hurd, who formerly held the office of Health Inspector, and was one of the ablest Coroners Paterson ever had, during his several years' incumbency, is as skillful as he is untiring in his responsible office. Paterson is one of the comparatively few cities in the United States that furnish carefully prepared and reliable tabulated statements of vital statistics to the State and National departments.

Since the establishment of a rain-gauge and other meteorological apparatus at the City Hall, in 1878, the reports from Paterson of meteorological phenomena, furnished by City Surveyor Hilton, have been very full and are regarded as valuable contributions in this department.

CHURCHES.

There are in the city forty-nine churches and chapels where religious services are held, many of them well arranged and commodious, with, as a rule, highly cultivated, zealous and talented pastors, and attended by fair-sized and some of them by very large congregations. Mission stations, shedding the kindly influence of Christianity here and there, have been established in various parts of the city, and, under the care of devoted and self-sacrificing teachers and preachers, these have, from year to year, grown in the number of their attendants and in usefulness until, one after another, they are passing from the embryotic state of chapledom and are assuming the duties and privileges of regularly organized churches.

As early as 1745 the First Totowa Dutch Reformed Church was erected. It stood at the foot of the Totowa hill, near the old cemetery, now a shamefully neglected spot, with no fence to protect the sunken mounds among which are seen the crumbling, moss-grown, brownstone slabs formerly in exclusive use for headstones, some fallen across the graves they were erected to mark, some falling, and few with inscriptions sufficiently legible to furnish the "short and simple annals" of the dead and gone "forefathers of the hamlet" of an hundred years ago. This cemetery is just off Water street at the point where it turns sharply to the North, at the intersection of the road leading to the quarry and the Valley of the Rocks.

The old church was a grotesque-looking building, with low stone walls and a high, four-sided peaked roof, with a bell at the top. For many years it was opened for public worship only every third Sabbath; but, finally, one sermon was delivered there every second Sabbath. The officers of the church collected the small offerings in a black bag attached to the end of a black rod, with a small bell fastened to the bottom of the bag. This bell they would ring as they approached, to arouse the congregation, who were apt to be drowsy when called upon to contribute. This half-monthly service continued until 1827, when the church was accidentally burned down. A diversity of opinion soon arose among the congregation as to the location of the building to supply its place, and after some bitter discussion they divided and formed two distinct congregations, each erecting a church for themselves. One branch grew into the First, or Division street, Reformed Church; the other



Chas. H. Myers M.D.

into the Second Reformed, of which the venerable pastor, Rev. J. H. Duryea, D.D., has had charge for upward of forty-three years. After the division each had service every Sabbath.

In 1814 the foundation of the First Presbyterian Church was laid, and since that period the different churches have been erected from time to time as the town and city increased. In 1832 there were two Presbyterian churches, two Dutch Reformed, one True Dutch Reformed, one Roman Catholic, one Methodist, one Episcopal and one Baptist. In 1856 there were twelve churches and about 3,000 Sunday-school pupils.

The era of competition in elegant and costly churches has not yet dawned upon Paterson. Few of the houses of worship are architecturally remarkable, though the Second Presbyterian, the First Reformed, the First Baptist, the Market Street Methodist Episcopal and several others are very commodious and soberly imposing. The First Presbyterian is severely plain outside, but has a handsome interior. The Second Presbyterian, among the most recent erections, is, perhaps, one of the most deserving of notice as an attractive and tasteful specimen of modern ecclesiastical architecture. St. Paul's Episcopal Church is a commodious edifice, of stone, pleasant and tasteful to the eye, but is severely plain within and without. The same may be said of the Episcopal Church of the Holy Communion, on Carroll street. The Roman Catholics, under the leadership of Rev. Father William McNulty, whose sleepless energy and determined resolution have accomplished wonders in building up the parish of St. John the Baptist, have erected what will be by far the most nobly imposing church edifice in Paterson. Its site is on Main street, at the corner of Grand street. It is of magnificent proportions, the design is full of character, and when the towers, etc., are completed, St. John's Church will rank with the largest, finest and most costly ecclesiastical structures in the State. Its interior is rich and tasteful, and its splendid organ, a recent purchase, one of the best instruments for church purposes procurable. The names, locations, and names of pastors now in charge of the several churches are as follows:

PRESBYTERIAN.—First: Main street, corner of Ward street; pastor, Rev. David Magie, D.D. Second: Corner of Ellison and Church streets; pastor, Rev. Charles D. Shaw, D.D. Third: Grand street, corner of Prince street; pastor, Rev. J. B. Galloway. Fourth: Lakeview; pulpit supplied. United: Smith street; pastor, Rev. Alexander Smith. First German: Elm street; pastor, Rev. John Landau. Second German: Broadway; pastor, Rev. T. E. Voegelin.

BAPTIST.—First: Corner of East Van Houten and Washington streets; pastor, Rev. E. A. Woods. Willis Street: Willis, near Straight street; pastor, Rev. S. Washington. Union Avenue: Union avenue; pastor, Rev. J. B. McQuillan. Fourth: York avenue, corner of Tyler street; pastor, Rev. Walter Gallant.

REFORMED.—First: Division street, East of Straight street; pastor, Rev. J. L. Danner. Second: Corner of Water and Temple streets; pastor, Rev. John H. Duryea, D.D. Broadway: Broadway, near Paterson street; pastor, Rev. N. H. Van Arsdale. Union: Corner of Governor and Tyler streets; pastor, Rev. H. E. Niese. First Holland: Corner of Clinton and First streets; pastor, Rev. James Huyssoon. Sixth Holland: Godwin street, near Paterson street; pastor, Rev. H. R. Koopman. Holland Seceder: Corner of River and Bridge streets; pastor, Rev. L. Reitdyk.

METHODIST EPISCOPAL.—Cross street: Cross street, corner of Elm street; pastor, Rev. J. I. Boswell. Prospect street: Prospect street, near Ellison; pastor, Rev. S. N. Bebout. Market Street: Market street, opposite Prince street; pastor, Rev. J. H. Dally. Paterson Avenue: Paterson avenue, corner of Totowa avenue; pastor, Rev. J. A. Gutteridge. Grace: Water street, near Temple street; pastor, Rev. S. P. Hammond. Sixth: 293 Main street; pastor, Rev. S. W. Decker.

METHODIST PROTESTANT.—First: Division street, near Bridge street; pastor, Rev. J. H. Robinson. Second: Main street; pastor, Rev. W. S. Hawks.

AFRICAN METHODIST EPISCOPAL.—First: North First street, between Arch and Clinton streets; pastor, Rev. Anthony G. Lane. Second: Water, corner of Temple street; pastor, Rev. William Rogers. Zion: Godwin, near Bridge street; pastor, Rev. J. H. Hector.

CONGREGATIONAL.—Broadway Tabernacle: Broadway; pastor, Rev. S. Bourne.

PROTESTANT EPISCOPAL.—St. Paul's: Market street, corner of Hamilton street; Rector, Rev. Edwin B. Russell. Church of the Holy Communion: Corner of Carroll and Pearl streets; Rector, Rev. Charles Pelletreau.

ROMAN CATHOLIC.—St. John the Baptist: Corner of Main and Grand streets; pastor, Rev. William McNulty. St. Boniface, German: Corner of Main and Slater streets; pastor, Rev. Nicholas Hens. St. Mary's: Sherman avenue, near Union avenue; pastor, Rev. James Curran. St. Joseph's: Corner of Market and Carroll streets; pastor, Rev. Dr. Smith. St. Bonaventure: West Paterson, services in English and German; in charge of the Order of St. Francis.

GERMAN LUTHERAN.—St. Paul's: Van Houten, near Prospect street; pastor, Rev. Herman Steckholz.

JEWISH.—Congregation B'nai Jeshurun: Synagogue, Van Houten street, between Washington and Bridge streets; Rabbi, Rev. M. Cohen.

CHAPELS.—Westminster (Presbyterian): Spring street; pastor, Rev. L. T. Shuler. Fastside (Presbyterian): Twenty-ninth, corner of Willis street; services every Sunday, conducted by supplies. Trinity (Episcopal): Totowa; services conducted by supplies. Calvary (Episcopal): Riverside; services conducted by supplies. St. Joseph's (Roman Catholic): Totowa, near Lincoln Bridge. St. Joseph's (Roman Catholic): at St. Joseph's Hospital; services by Hospital Chaplain. Beech Street Mission (Methodist Episcopal): Beech street; services conducted by supplies. City Mission (non-sectarian): Corner of North Straight and Holsman streets; services conducted by supplies. Chapel of the New Church (Swedenborgian): No. 25 Division street; pastor, Albert P. Schack. The Westminster and Eastside Chapels have applied for recognition as churches by the Presbyterian and will probably be admitted very soon.

CEMETERIES.

One of the features of Paterson is its beautiful cemetery, called Cedar Lawn, lying on the bank of the Passaic river, near Dundee lake, a surpassingly charming location and altogether suitable for the purpose. Under the skillful engineering of General Viele it has been laid out with exquisite taste, and every year witnesses a remarkable improvement in this silently beautiful City of the Dead. The successful carrying out of this most important step in Paterson's progress was due largely to the energy and public spirit of Messrs. F. C. Beckwith, Adam Carr, John J. Brown and Henry A. Williams, the first officers of the company, which was organized in 1869, the cemetery being dedicated September 19th of that year. Cedar Lawn has the advantage of being so situated that, although within the limits of Paterson, it is so entirely out of the direct line of the city's progress as to render it free from the danger of encroachment to which all cemeteries lying in the immediate suburbs of large cities are more or less liable.

A large amount of money has been expended in beautifying and laying the cemetery out in avenues and walks; the land has in many places been raised and its natural conformation improved, with a just regard to making the grounds both available and attractive. The natural beauties of the spot have been greatly enhanced by a tastefully ordered profusion of trees, shrubbery and flowers. Numerous monuments of artistic design have been erected, and additions to their number are constantly being made. An excellent receiving tomb is provided for the use of lot owners or those intending to purchase lots. The report of the Secretary at the close of 1881 showed that during the fourteen years the cemetery had been in existence 1,590 lots had been sold to about 1,800 proprietors. The interment record

showed 3,921 original interments and 1,567 removals from other grounds, making 5,488 interments to December 1st, 1881.

What are known as the Sandy Hill cemeteries, belonging to different denominations, were for many years the principal burying places in the city, but since the establishment of Cedar Lawn many of the dead are being transferred to the new grounds, where they will be far removed from the danger of disturbance by unsympathetic hands which threatens the old cemeteries in the heart of the city proper.

A shrewd philosopher in social science has said: "Let me see the burial place of a people and I can tell the degree of taste, refinement and kindly feeling that exists among them." In the application of such a test Paterson has nothing to fear, Cedar Lawn being already one of the most beautiful cemeteries in the State.

The present officers of the company are: Henry B. Crosby, President; John H. Hindle, Vice-President; Garret A. Hobart, Treasurer; George H. Albutt, Secretary.

The Roman Catholic Cemetery of the Holy Sepulchre, at Lincoln Bridge, and the Lutheran Cemetery, at "The Goffle," also are being made very attractive, and will, in time, become beautiful grounds.



CHAPTER XLIII.

GASLIGHT COMPANIES.

THE Paterson Gaslight Company was formed as early as 1825, but little was accomplished by it until about 1847, when some Philadelphia capitalists took hold of the business and gas works were established in Jersey street, at the canal bank, with a gasometer in Mulberry street. About five years later, in 1852, Main street was first lighted with gas. After struggling against adverse conditions for many years the business became more prosperous and a few years ago very extensive works were built at Riverside, which were greatly enlarged during 1882, when the necessary appliances were added to make gas by the "Lowe process," of coal oil and naphtha, as well as from coal only, as formerly. The capital of the company is \$275,000, and dividends from three to ten per cent. per annum have been declared for several years past. John Reynolds is President of the company, and William L. Williams Superintendent of the works.

The Paterson Gaslight Company supplied the city street lamps until 1880, when, the People's Gaslight Company having been formed, the contract for a term of five years was competed for, and the last-named company, being the lowest bidder, received the award. This company manufactures gas from petroleum, and in the short period during which it has been established has gained a firm footing, and is now supplying a large number of consumers, including many extensive factories.

SECRET SOCIETIES.

There are a large number of secret societies in Paterson, including six lodges of the Masonic Order. The first local Masonic organization of which there is any record was "Paterson Orange Lodge," founded very shortly after the town of Paterson was located, and granted a warrant by the Grand Lodge in 1796. The organization was maintained until about 1825-6, when it "died out," and little was done among members of the Order in Paterson for the space of ten years, when Passaic Lodge, No. 13, was organized, mainly by former members of the pioneer lodge, as nearly as can be ascertained. A few years later there was another falling away, and Masonry languished from about 1840 until 1853, when steps were taken looking

toward a revival, and in 1854 Joppa Lodge, No. 29, was organized and began a prosperous existence, with Isaac Van Wagoner as W. M. Paterson Orange Lodge, No. 48, was formed in 1856, and in 1857, Benevolent, No. 45. Falls City Lodge received a warrant about 1867, and the next year a dispensation was granted for the formation of Ivanhoe, No. 88. Two years later, in 1870, Humboldt, No. 114, largely a German organization, was formed. There are various Councils, Chapters, etc., connected with the Order, which is estimated to number nearly or quite one thousand members in Paterson.

Paterson Odd Fellows can boast of having the oldest organization of the Order in the State, Benevolent Lodge, No. 2, being properly No. 1, as conceded, though through some informality or neglect it failed to receive official recognition as such. Odd Fellows' Hall was erected, mainly under the auspices of this lodge, in 1848. Besides Benevolent, there are Passaic Lodge No. 33, organized about 1870, and Industry Encampment, No. 1, also of this Order. There are two Chapters of the Order Eastern Star—Martha Washington and Miriam, both prosperous organizations; two lodges of the Knights of Pythias, a numerous and successful Order, Fabiola and Zeno; one lodge, Germania No. 7, of the Order of Druids, besides an almost endless number of organizations of every conceivable character and formed for every imaginable object connected with the various secret societies throughout the country.

NEWSPAPERS.

According to the best procurable data the first newspaper published within the limits of Paterson was *The Bee and Paterson Advertiser*, which was born in 1816, and the second in order of time was *The Bergen Express and Paterson Advertiser*, born a year later. Both died of inanition, each at the age of about one year.* *The Courier* was started a year or two later, and was more tenacious of life; it succumbed about the year 1824, after upward of three years' struggle. The *Chronicle* was contemporary and, like its predecessors, was not a success. After a few years the name was changed to *The Paterson Intelligencer*, a more prosperous enterprise, this newspaper being published for upward of thirty years, from about 1825 to 1856. An instance of the intense conservatism of the first editor of the *Chronicle* was related by ex-Governor Dickerson in his lecture, in 1856, before the Paterson Educational Association, as follows:

"I cannot readily forget an illustration of the modesty of its first editor. He was requested to publish a short communication against the British government, but declined, because, as he very modestly and seriously remarked, he was not willing 'to get into a political squabble with the *London Times*.' It is, however, due to the editor to say that this was soon after he issued his first *Chronicle*, and he did not yet know the exact extent of its future circulation."

According to ex-Governor Dickerson there was another weekly paper, called the *Courier*, started in 1833, which continued to be published under that title until 1836, when the name was changed to the *Passaic Guardian*, which it bore until 1846, when it was rechristened the *Paterson Guardian*. The same authority gives

*Ex-Governor Philemon Dickerson's lecture on "The City of Paterson; its Past, Present and Future," delivered January 31st, 1856.

a brief account of the *People's Mirror*, established in 1855, and the *Falls City Register*, started the same year, both being weeklies; also, of the *Iron Horse*, another weekly, which entered upon its course in 1856. "So that," said the lecturer, "we now (1856) have five weekly newspapers regularly published, and I have not yet heard that either of them has had the misfortune to get into a political squabble with the London *Times*."

Another authority describes the *Mirror*, started by McClellan & Halstead in 1855, as a daily, the first published in Paterson, and adds that in 1856 all the stock and office equipment fell into the hands of Col. A. B. Woodruff, who about that time established the *Independent Democrat*, which he conducted for a time as a "straightout" Democratic journal, after which it passed into the hands of the brothers Gihon, James L. and John H., who, one after the other, continued it for a time, lost much money and finally abandoned it. The *Iron Horse* was started by William Wright, a most talented and versatile gentleman, afterward editor of the *Paterson Press*, but it was short-lived, being discontinued about one year from the start, Mr. Wright soon after establishing a campaign paper in the interest of General Fremont for President, called the *Republican*, afterward consolidated with the *Guardian*, which was first published as a daily in November, 1856, Vanderhoven, Irish & Wright, proprietors. Various changes were made in the newspapers named, but no other enterprises of note were started until several years subsequently.

At present there are two daily (both evening) newspapers, each publishing a weekly edition, four weekly and one tri-weekly.

The *Guardian* has been a daily for upward of a quarter of a century. It was purchased in May, 1872, of Vanderhoven & Webb, the then proprietors, by C. M. & A. Herrick, brothers, formerly of the New York *Atlas*, which was the first Sunday newspaper published in New York city, having been founded by the late Anson Herrick, the father of the above-named. The *Guardian*, which is Democratic in politics, is ably and carefully edited, is very progressive, independent and outspoken, and has a large circulation, which is rapidly increasing. Anson, the younger of the two brothers, died in 1878, leaving Carleton M. Herrick, who has been editor from the time of the purchase, sole proprietor.

The *Press* was founded as a Republican newspaper in September, 1863, and for a short time was edited by William Wright, before alluded to. He was a vigorous and trenchant journalist, of more than ordinary ability. He was succeeded in 1865 by George Wurts, the present talented editor and co-partner, the publishers being Chiswell & Wurts. Mr. Wurts has been engaged in journalistic work since 1861, leaving the position of associate editor of the Brooklyn *Union* to assume his present chair of editor-in-chief in 1865. Twice within the first four years of its existence the *Press* found it advantageous to expand its columns, and it has been enlarged several times since. Its circulation is very large and its influence widespread. Both dailies will compare favorably in every respect with any published in the State.

The *Labor Standard* is neutral in politics and, as the name indicates, aspires to represent the laboring class. J. P. McDonnell is editor and publisher. The *Family Herald* is a weekly paper issued from the same office. The *Volkstfreund*,

edited and published by Charles A. Boeger, and which is independent in politics, has grown from a weekly to a tri-weekly and, being an enterprising sheet, will doubtless soon take its place with the dailies. The *Home Journal*, a family paper, with more than a strong bias toward the Temperance movement, is owned and edited by W. H. H. Bartram, a gentleman of very excellent ability, both as a writer and a public speaker. *De Telegraaf* is a weekly paper published in Hollandische, having a considerable circulation both in Paterson and in other cities where there is a Holland element. Henry Beeuwkes is editor and proprietor.

THE PATERSON MUSICAL UNION.

On the evening of November 24th, 1873, at a meeting of a number of gentlemen prominent in musical circles, steps were taken in the direction of a "court dress concert." The meeting was held at the office of Isaac F. Boice, and among those present were Messrs. A. H. Decker, H. B. Utter, J. C. Christie, L. A. Piaget, J. L. Stagg, William Clerihew, James Crooks, E. W. Kohlsaat and George T. Rowlee. Mr. Decker was chairman, and Mr. Boice secretary of the meeting. Committees were appointed to make the necessary arrangements and to secure, if possible, the services, as conductor, of Florian Oborski, a gentleman who had already attracted the attention of the musical public, though a comparatively recent arrival in Paterson from his native Poland. All this was accomplished, and on January 13th, 1874, the concert was given at the Opera House and proved a signal success, however considered, the financial results being represented by the sum of nearly \$500, which was devoted to a charitable purpose. At a reunion of those who participated in the concert, a few evenings later, Professor Henry Waters, in the name of the singers who participated, presented Mr. Oborski with a silver-mounted ebony baton as a token of their appreciation of his services as conductor. The more prominent among the musical portion of the community, believing that in Mr. Oborski they had discovered a good leader, as well as conductor, decided to hold a meeting to organize a musical association. An informal meeting was first held at Mr. Boice's office, and afterward another meeting, at the residence of Mrs. H. M. Low, when the organization was completed by the election of Henry Waters, President; James C. Christie, Vice-President; I. F. Boice, Secretary; Louis A. Piaget, Treasurer; Executive Committee: J. L. Stagg, A. H. Decker, Howard Utter, Henry Waters, M. C. Post; Librarian, M. Barton; Conductor, Florian Oborski; Music Committee: J. L. Stagg, F. Oborski, J. C. Christie. Eleven ladies and eleven gentlemen of the "court dress concert" chorus were present at this meeting. At a subsequent meeting a constitution and by-laws, prepared by a committee consisting of E. W. Kohlsaat, L. A. Piaget and J. L. Stagg, were adopted, Mr. Oborski's acceptance of the conductorship was received, and it was decided to hold the regular rehearsals of the Association in St. Paul's Chapel, which is still occupied for the purpose. The new organization was named the "Paterson Musical Union," and its object is set forth in the second article of its Constitution, which reads as follows:

"The object of the Union is the practice and improvement of its members in choral music, both sacred and secular, and the establishment in Paterson of a permanent institution for the encouragement and promotion of musical talent."

The first public rehearsal of the Union was held May 18th, 1874, when Miss Campbell and Mrs. G. H. Low were the soloists. The programme was varied and difficult; all acquitted themselves well. The first public concert was given in the Paterson Opera House on Tuesday evening, June 16th, 1874, and was an artistic as well as a financial success. The second public concert was given December 3rd, 1874, and the second public rehearsal occurred February 1st, 1875, in St. Paul's Chapel. The third concert was given April 27th, 1875.

Thus the Union progressed, giving its public rehearsals and concerts from time to time, these entertainments being instructive and elevating in their tendency. May 16th and 17th, 1876, the Union gave a Centennial Festival, which was a notable triumph. The latest appearance of the Union before the public occurred May 25th, 1882, when a public rehearsal was given at the First Baptist Church to a refined and appreciative audience. The soloists on this occasion were Misses Duryea and Kohlhaas, and Messrs. Louis A. Piaget, Frank Frost and Wessels Ryerson. This was, perhaps, the greatest success yet achieved by the organization, and it became more clearly apparent even than before how excellent a work has been accomplished by it for musical art in Paterson.

In 1878 the Union inaugurated what has since become an annual Summer pleasuring, by an excursion to Greenwood Lake, July 2nd of that year. From the day of its organization the Union has proven a musical success, and its financial condition has always been sound, the result, it must be said, of the excellent management by its officers. The music practiced and rendered has always been of a high order; on the programmes and in the library of the Union are to be found many of the finest and most difficult works of the old masters, among the highest and best known to the world of musical art. The active membership of the organization is 88; associate members, 40; honorary members, 2. The officers of the Union at the beginning of 1882 were: President, Heber Wells; Vice-President, Catholina Lambert; Secretary, Isaac F. Boice; Treasurer, James C. Christie; Librarian, Cornelius S. Terhune; Assistant Librarian, George Ramsey; Conductor, Florian Oborski; Pianist, Miss Susan W. Greer. But one death has occurred within the Union since its organization, that of Miss Ella Quin, a daughter of Dr. John Quin, and a most estimable young lady, who died April 15th, 1882, sincerely mourned by her fellow members, who directed their Secretary to enter a suitable minute on the records in regretful memory of their departed associate.

BANKING INSTITUTIONS.

Prior to 1864 there was no financial institution of consequence in Paterson; none, certainly, that exerted any influence favorable to the prosperity of the city. All the banks save one had passed away, several of them bringing disaster in their downfall, and all of them, in closing up, leaving an unpleasant impression as to the uncertainties and perils of banking, and misgivings in regard to the fate of whatever similar institutions might succeed them. There was one exception to the otherwise universal failure. An institution, at that time a State bank of small means, but which afterward grew into the present Second National Bank, withstood

the troublous times, but it afforded little convenience to the business portion of the community, and most of the banking and insurance accounts were kept elsewhere. The encouragement to economy, too, was left to institutions of other cities, there being no savings banks in Paterson.

The first local bank of which there is any record was the Paterson Bank, incorporated in 1815, with Daniel Holsman as President and Andrew Parsons Cashier, and a capital of \$200,000. In 1816 what was afterward known as the "Old Bank" was built at Nos. 217, 219 and 221 Main street, by far the finest building in Paterson at the time. The second President was Judge Garrabrandt Van Houten. The bank failed June 2nd, 1829, through lack of sound capital and, in part, also, it is said, through jealousy. In 1834 the institution was revived, with John Travers for President and J. M. Redmond Cashier, and it survived until 1837, about three years, when it went under in the general crash of that year.

The People's Bank was chartered in 1824 with a nominal capital of \$250,000, of which \$75,000 was paid in a few years later, about 1832. It was an institution that owed its existence mainly to the great cotton manufacturers, A. & R. Carrick, Alexander Carrick being its first President. The location was at first at the corner of Bank and Ryerson streets, whence it was removed to "Boudinot," now Van Houten, street, near Cross, whence it was removed to No. 172 Main street, whence it was removed to "Congress," now Market, street, opposite Prospect street, whence it was removed, and for the last time, to the building before referred to as the "Old Bank." Alexander Carrick was succeeded as President by Robert Carrick, who, in turn, was succeeded by George Seeley, Judge D. B. Ogden and David Burnett, in the order named. The first cashier was James Nazro, who was succeeded by Henry C. Stinson, a sharp New Yorker, who seems to have managed the business pretty nearly in his own way. The bank went down in 1851, carrying disaster with it to many of the hard-working and struggling mechanics and business men of the city. The public indignation was very great, and Rev. Dr. Hornblower, then a noted clergyman in the city, preached a sermon about the bank failure, taking for his text: "And the cup was found in Benjamin's sack." At one time a popular outbreak was threatened, vast crowds surging about the residence of the more than suspected cashier, Stinson, at the Northwest corner of Market and Church streets.

The Mechanics' Bank was organized in 1832, one Dr. Sherman, of New York city, being chief promoter of the enterprise. Like several other projects of a financial character in the early part of the century this bank, also, was the development of a scheme by New York capitalists, New Jersey being regarded at the time, with Maryland, Delaware and several other States, as excellent ground whereon to start wildcat swindling banking institutions, with little capital and of no real value to the public. The usual course was to commend the institution to the public by selecting local officers, in whom the people would repose confidence. Pursuant to this method, Caleb Munson Godwin was chosen President, and Brown King Cashier. The bank was short-lived, going out like a candle snuff about 1834, at less than two years of age. Its founder, Dr. Sherman, was afterward confined in the New York State prison for some financial swindling operation. The bills of the Mechanics' Bank were of remarkable appearance, showing a railway train of that period dashing onward over what appeared a very imperfect track.

The Cataract City Bank was the next institution of this class started in Paterson by New York operators. John Sherman, of the Tenth Ward Bank, New York, was at the head of the enterprise. The charter was obtained under the general banking law which had been passed not long before. The Cataract City had no capital, but a trifling volume of deposits, and was run only as a vehicle through which to issue notes to the extreme limit allowed by law. Several of the principal operators, including Charles Sandford and J. M. Beach, were convicted of swindling and conspiracy, and sent to the State Prison, where Sandford died.

The National Bank of Paterson was organized in 1862 under the general law, and was operated with New York capital. John B. Sarson was the first President; the location was in a small building in lower Main street, opposite Fair. Refusing to reorganize under the National Banking act, the officers wound up the institution; it did not fail.

The Paterson Savings Bank was a small concern, with not more than \$50,000 on deposit. H. O. Hedge was Secretary and Treasurer. The institution was weak from the start and soon wound up, without much loss to any one.

The Paterson Fire Insurance Company was, in its day, ranked among the banking institutions of Paterson, as the avowed object of its founders was to aggregate capital to loan; to perform the double office of gathering and spreading. The institution was chartered in February, 1868; it was organized for business in May, 1872, with a capital of \$100,000; the capital was increased to \$200,000 in the latter part of 1875, and shortly after it succumbed to the pressure of the times, causing a heavy loss to the stockholders and others, the business being closed up by a receiver. The officers were: John J. Brown, President; F. C. Van Dyk and D. B. Beam, Vice-Presidents; E. R. Mason, Treasurer; Thaddeus Sherman, Secretary.

The Merchants' Loan and Trust Company, also a banking institution, was chartered in February, 1872, and commenced business in December of the same year with a paid-up capital of \$100,000. This institution had a savings department and conducted it with some of the privileges and limitations found only in savings banks. It had a surplus of \$9,400 after three years' existence, and promised to become a useful institution, but the same cause that led to the voluntary closing of the Passaic County Savings Bank and the failure of the Paterson Insurance Company operated adversely to this institution, and, after an existence of about six years, it went down, causing great embarrassment and considerable loss to depositors, the assets being largely locked up and in no condition to realize on. Even up to the close of 1881 the affairs of the company were not closed up, the receiver not being able to sell the real estate at satisfactory prices. The officers of the company were: C. Lambert, President; Alex. King, Vice President; J. F. Preston, Secretary and Treasurer.

The Passaic County Savings Bank was chartered April 3rd, 1872, and commenced business in the June following. Though managed by careful and intelligent men, the panic of 1873 and the consequent shrinkage in business and values acted so adversely on the institution that it was deemed best to close it up, which was done in 1878, after a moderately useful career of about six years, not a dollar being lost to the depositors. Had this bank been continued in existence a few years longer it

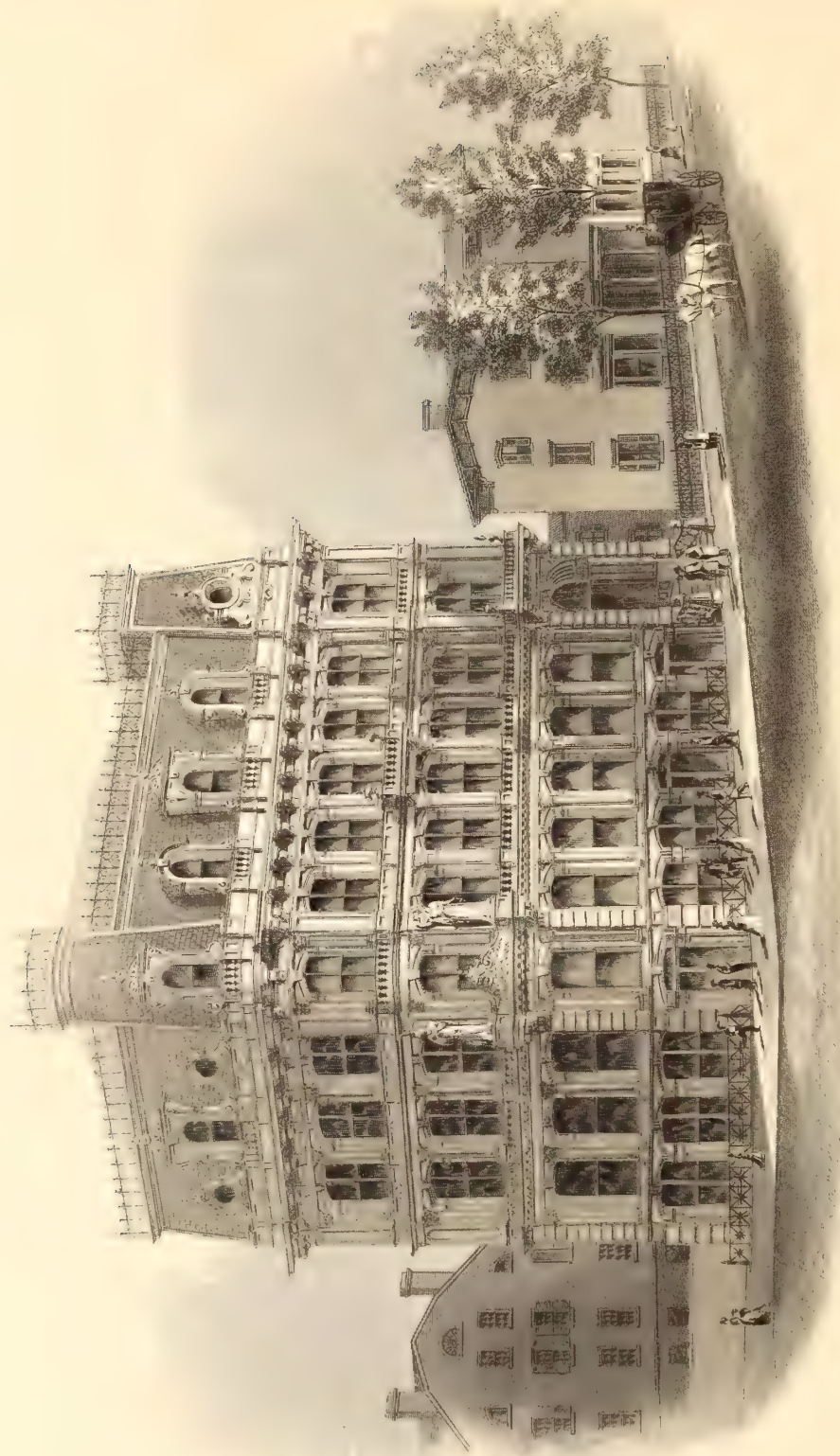


Fig. 1. Architectural.

would doubtless have become, in time, one of the most important financial institutions of the city. The officers were: President, William G. Watson; Vice-Presidents, James Booth and John Dunlop; Secretary and Treasurer, John W. Bensen.

THE FIRST NATIONAL BANK.

In the Autumn of 1864 it became known to a few gentlemen that the charter of the First National Bank, which had been organized under the then new National Banking law (but which had not yet fairly commenced business), was about to be surrendered, and that application to the banking authorities at Washington for closing the bank had already been made. This seemed, under the existing circumstances of an absolute dearth of banking capital, the apparent certainty of success of a well managed institution, and the unprecedentedly favorable time for establishing a bank, to be little less than a crime. A vigorous effort was made, encountering, of course, all the objections and all the unfavorable impressions before described, which resulted, however, in saving the charter and establishing the present bank with the moderate capital of \$100,000.

So fully were the expectations of success realized that only a few months intervened when it was made apparent that more capital could be usefully and profitably employed. Being already a success, little difficulty was found in increasing the capital to \$250,000, which was done January 1st, 1865.

On the first of January, 1868, the capital was increased to \$350,000; and on January 1st, 1870, to \$400,000, which is the present nominal capital. Having accumulated a surplus of \$150,000, the working capital is, of course, \$550,000. The bank, in addition to the earned surplus, has paid to its stockholders dividends equal to nearly eleven per cent. per annum, free of all taxes. The deposits, as shown by the reports, reach about \$1,000,000. It is regarded as one of the soundest banks in the State. The building owned by the corporation, and in which the business is transacted, is one of the best, most imposing and most costly in the city, being perhaps the most ornamental of any of the buildings thus far erected. It is of iron, four stories high, of a beautiful style of architecture, and is painted white. It was erected in 1871 by J. B. & J. M. Cornell, of New York, the architect being G. Thomas, also of that city, at a cost of \$120,000. The building committee comprised John J. Brown, E. T. Bell, John Swinburne, John Reynolds and W. W. Fairbanks. The Post Office and Western Union Telegraph Office occupy the first floor; the second is used for banking and for the bank directors' room; the third and fourth floors are devoted to offices, etc. The second floor is elegantly fitted up for the business of the bank, the walls being frescoed and the counters having panels of marble, trimmed with Scotch granite.*

*The first directors of this bank were: John J. Brown, John Cooke, John Reynolds, John Swinburne, Henry B. Crosby, John N. Terhune, J. P. Huntoon, J. S. Christie, Edward C. May, Patrick Curran, William Gledhill, Henry M. Low and George M. Stinson. Officers: John J. Brown, President; J. S. Christie, Vice-President; E. Theo. Bell, Cashier.

Present directors: Messrs. Brown, W. O. Fayerweather, Reynolds, Swinburne, Crosby, Terhune, Huntoon, John T. Spear, Henry A. Williams, Garret D. Voorhis, E. Theo. Bell and Alex. W. Rogers. Officers: John J. Brown, President; E. Theo. Bell, Vice-President; A. Fardon, Cashier.

SECOND NATIONAL BANK.

This bank, now one of the permanent and flourishing institutions of the city, grew out of the Passaic County National Bank, which, before the passage of the National Banking law, was a State bank, known for many years as the Passaic County Bank. As before mentioned, this was the only exception to the utter dearth of financial institutions in the city. This bank was chartered in 1865 and commenced business February 2nd of that year. In 1871 it was reorganized. A board of directors of well known business men were brought into its management, and ever since it has been a successful and useful institution. Its present capital is \$150,000; its surplus, \$19,000; average deposits, \$350,000; regular dividends are paid of eight to ten per cent. per annum.*

PATERSON SAVINGS INSTITUTION.

For a long time prior to 1869 there was felt to be a great need of an institution for savings. No encouragement could be given for savings in small sums, for there was no place of deposit where interest was paid. Neither was there any place for the aggregation of capital to be used for permanent loans. The only savings bank ever established in the city had, with the other banks, passed away, leaving the like flavor of instability and insecurity. This made the organization of a savings bank a work of boldness as well as one of delicacy.

To give confidence to a community not over credulous as to the security and permanency of such banks, the Savings Institution was organized not only with all the limitations and safeguards of ordinary savings banks, but with the addition of a guaranteed capital stock; copying the liability of stockholders from the National Banking law, which carries with it a liability of not only the capital stock subscribed, but an equal amount in addition, all of which is by law made liable for any debts due from the institution. It was chartered April 2nd, 1869, and commenced business on the first of the following month. The success of the effort fully justified the expectations of its managers. Its growth will be indicated by the record of the net deposits at the end of each fiscal year, as follows:

May 1st, 1870	\$194,422 00	May 1st, 1876	\$764,070 32
" " 1871	203,626 00	" " 1877	778,613 99
" " 1872	435,445 00	" " 1878	561,540 45
" " 1873	558,589 00	" " 1879	728,943 90
" " 1874	509,551 00	" " 1880	1,098,808 31
" " 1875	643,768 88	" " 1881	1,494,587 15

The funds have been loaned so as to aid, as fully as safety would warrant, the business and building interests of the city.†

*The directors are: James Jackson, John Dunlop, James M. Row, F. C. Van Dyk, James Blundell, Edward Osborne, Samuel Nathan, Peter Doremus, G. I. Blauvelt and S. Smith. Officers: James Jackson, President; F. C. Van Dyk, Vice-President; James M. Row, Cashier.

†The first board of trustees were: Robert Hamil, John Reynolds, John J. Brown, Josiah P. Huntoon, Henry B. Crosby, John Swinburne, Edward C. May, John Hopper, Patrick Curran, John N. Terhune, J. S. Christie, W. W. Fairbanks, Andrew Derrom and E. Theo. Bell. Officers: Robert Hamil, President; Andrew Derrom, Vice-President; E. Theo. Bell, Secretary and Treasurer.

Present Board: Messrs. Reynolds, Brown, Huntoon, Crosby, Swinburne, Hopper, Terhune, Bell, G. D. Voorhis, Robert S. Hughes, A. S. Allen, E. B. King, J. H. Robinson, G. A. Hobart, H. A. Williams, John T. Spear and Peter Banuigan. Officers: John Reynolds, President; H. B. Crosby, Vice-President; Edo I. Merselis, Secretary and Treasurer.

The total aggregate of funds in the three existing financial institutions of Paterson may be set down as follows :

First National Bank.....	\$1,000,000 00
Second National Bank.....	350,000 00
Paterson Savings Institution.....	1,700,000 00
Total.....	<u>\$3,050,000 00</u>



CHAPTER XLIV.

EDUCATIONAL.—SCHOOLMASTERS OF THE OLDEN TIME.—PATERSON'S
FREE SCHOOL SYSTEM, ETC.

AFTER much patient research it is clear that in the earlier years of the settlement of Paterson, and vicinity but little attention was paid to the subject of education. Of learning, books and schools the rude forefathers of the hamlet knew little, as a general thing, and cared less. The most diligent inquiry results in but little information being gained. There is a tradition that about the year 1790 one Thomas Wells kept a private school in the neighborhood of the Bend or "Bocht," in one of those old houses described in a foregoing chapter devoted to an "Outline of Local History." There was also another, which was first kept in a little house between the old Van Riper, now the Samuel S. Sherwood, residence, and that of the Terhunes, by a man named William Jenner, and, after him, by one Henderson.

The principal school of all in that day was without doubt the "Wesel School," located where Peter Van Houten's residence now is, at the corner of Market street and the Wesel road, just before the bridge is reached. To this the children of most residents along the "York road" wended their way Summer and Winter, encountering inclemency of the weather and other hardships, to say nothing of the great distance, that would make the masters and misses of the present day, enjoying the privileges of our excellent educational system, open their eyes in amazement.

The "Wesel School" was a most primitive structure, 40x25 feet in extent, with walls eight feet high, of stone laid in clay or mud mortar. Here the school-master lived and taught. It is recorded that by the year 1820 the clay mortar had fallen out between the stones and the walls were so full of air holes that the old structure gained the name of "the Bellows." At this date the teacher received twelve shillings per quarter for each pupil if he "found" himself, or ten shillings if he "boarded round."* Up to 1810 there was no bridge across the river within three miles of the "Wesel School," and in Summer those children living on the opposite side were ferried over; in Winter they crossed on the ice. This school was fairly typical of the early country schools of the time, and very much as they may be found even now in remote country districts.

* Historical Sketch of Schools in Paterson, by William Nelson, 1877.

SCHOOLMASTERS OF THE OLDEN TIME.

Besides Jenner, who taught the "Wesel School" first about 1798, and again, after several years' absence—during which he taught at Preakness—from 1813 to 1815, about which date he disappeared and was never again seen in this vicinity, there was his successor, Joseph Henderson, briefly alluded to, who is represented as "an old tyrant," who taught the "Wesel School" from 1802 to 1806-7, when he was succeeded by Bernard Sheridan, an intelligent Irishman with a marked brogue. He kept the school up to a very high standard; so much so, that he had as many as seventy pupils at one time, and children came as much as three or four miles to enjoy the benefit of his instruction. He was teaching there in 1811, as appears by the following communication in the *Newark Sentinel* in June of that year:

"On Saturday last a school exhibition was held in Mr. B. N. Sheridan's school, in the neighborhood of Weazel, near Paterson; and it is but due justice to Mr. Sheridan (considering the short period of tuition) to say that his pupils exceeded the most sanguine expectations of their parents, as well as the numerous audience who had the pleasure of being present at the exhibition."

On Sheridan's tombstone, in the First Reformed Churchyard at Passaic City, is this flattering tribute to his undoubted worth:

"Here lies an honest man at rest,
As ever God in his image bl-ss't.
A friend of man, a friend of truth;
A friend of age, a guide of youth.
If there's another world he lives in bliss;
If there is none he made the best of this."

Other teachers at the Wesel were Thomas Gould, who taught there about 1820; Jacob Goetschius, who had a wide reputation for "taking the hide off" his pupils, and Bryant Sheys, another learned Irishman, who taught until 1828 and died soon after. Sheys was a man of excellent parts, but too fond of the social glass. His eldest son was a natural artist, who one day seeing Thomas Paine in a butcher shop hastily made an excellent sketch of him on the butcher's block, and thus secured what is said to have been the only portrait of Paine in existence, that noted freethinker being morbidly averse to sitting to an artist. This singularly-obtained sketch was for many years to be seen at the old "Museum Hotel," at the Northeast corner of Main and Smith streets, Paterson.

One Carpenter succeeded Sheys at Wesel. After him came another teacher who remained but a few weeks. He dismissed the school one Saturday night, promising the pupils a sound flogging on the following Monday morning, for some real or fancied misbehavior. But alas for human frailty! That very night he visited a tavern at the Broadway bridge, got drunk, fell to fighting, and received two such black eyes and such a general battering that he was ashamed to be seen again by his pupils, and left the country for parts unknown. And so the children's quaking hearts on that gloomy Monday morning were once more full of gladness.*

The old school house, which had stood time's ravages for unknown years, at last fell into a state of hopeless decay, and about 1835 was torn down and replaced by a neat little frame building. This was supported as a "Union" school by the neigh-

* Nelson.

boring families on both sides of the river until about ten years ago, when the State law required all school districts to lie wholly in one county. The people on the Bergen County side of the river set about building a schoolhouse of their own, and soon the venerable landmark was removed, and the Wesel schoolhouse is no more.

Within six or eight years after Paterson was founded, or about the close of the last century, a schoolhouse was built at the Southeast corner of Broadway and Prospect street—one story high, of frame, about 20x30 feet in area. The first teacher was named Smith, who was succeeded by Joseph Sherburne, who taught there until May 1st, 1805, paying the S. U. M. £3 rent per annum, and eight shillings for the rent of a stove. Bryant Sheys also taught there for some time.*

Thomas Wills was one of the last teachers in this building, about 1820. Wills taught in and about Paterson (especially at Wagaraw) for perhaps thirty years, and was highly esteemed. He died February 7th, 1823, and lies interred in the old Totowa burying ground.

As early as 1794 the Society for Establishing Useful Manufactures, at the suggestion and request of their agent, Peter Colt, established a Sunday-school for the gratuitous instruction of the children employed in their factory and all others who would attend; and proper funds were appropriated for the purpose. This was probably the first Sunday-school ever established in this State, and did much honor, as well to the man who suggested it, as to the company who encouraged it; but it continued for a short time only, as the Society soon ceased their operations.

In 1799 a public boarding-school was established by the Rev. John Phillips and his wife, for the education of young ladies and gentlemen. The young ladies' school was kept in the large wooden building then standing on Market street, opposite Congress Hall, which was afterwards converted into a machine-shop, and destroyed by fire many years ago. The young men were taught in a wooden building then standing on Market street near Main, the site of the present Masonic Hall. These schools were well attended for two years, when they were discontinued. Another Sunday-school was established in 1814 and continued for some time by Aaron and Robert King. From that period until 1829 there is very little reliable information as to the condition of the school interest.

Passing over the intervening period, in which nothing remarkable was done in the cause of education, it is found that it was in 1854, under the provisions of an act approved on March 9th of that year, that Paterson first enjoyed the advantage of

A FREE SCHOOL SYSTEM.

Prior to that time the only system of gratuitous education was that commonly in vogue in country districts or townships, the taxpayers coming together annually and voting a stated sum for school purposes for the ensuing year. In 1853 the sum thus voted in Paterson was but \$700, which was expended mainly in the tuition of children of the poorer classes, whose parents were unable to send them to any of the numerous private schools then existing. Of this amount during the year referred to two hundred dollars were devoted to the maintenance of a school then

* Vide Nelson's History.



W. H. L. & Co. N.Y.

held in a building next to the Cross Street Methodist Church, and having an average attendance of 150 pupils, and five hundred dollars toward that of another school, with about 300 pupils, located in the block West of Main street and between Ellison and Van Houten streets. It should be stated, however, that these schools were also aided by a State appropriation of a few hundred dollars. Admission was secured upon tickets issued by the Trustees. The expenditure of the school fund was made upon the basis of who would contract to teach the most children for the least money.

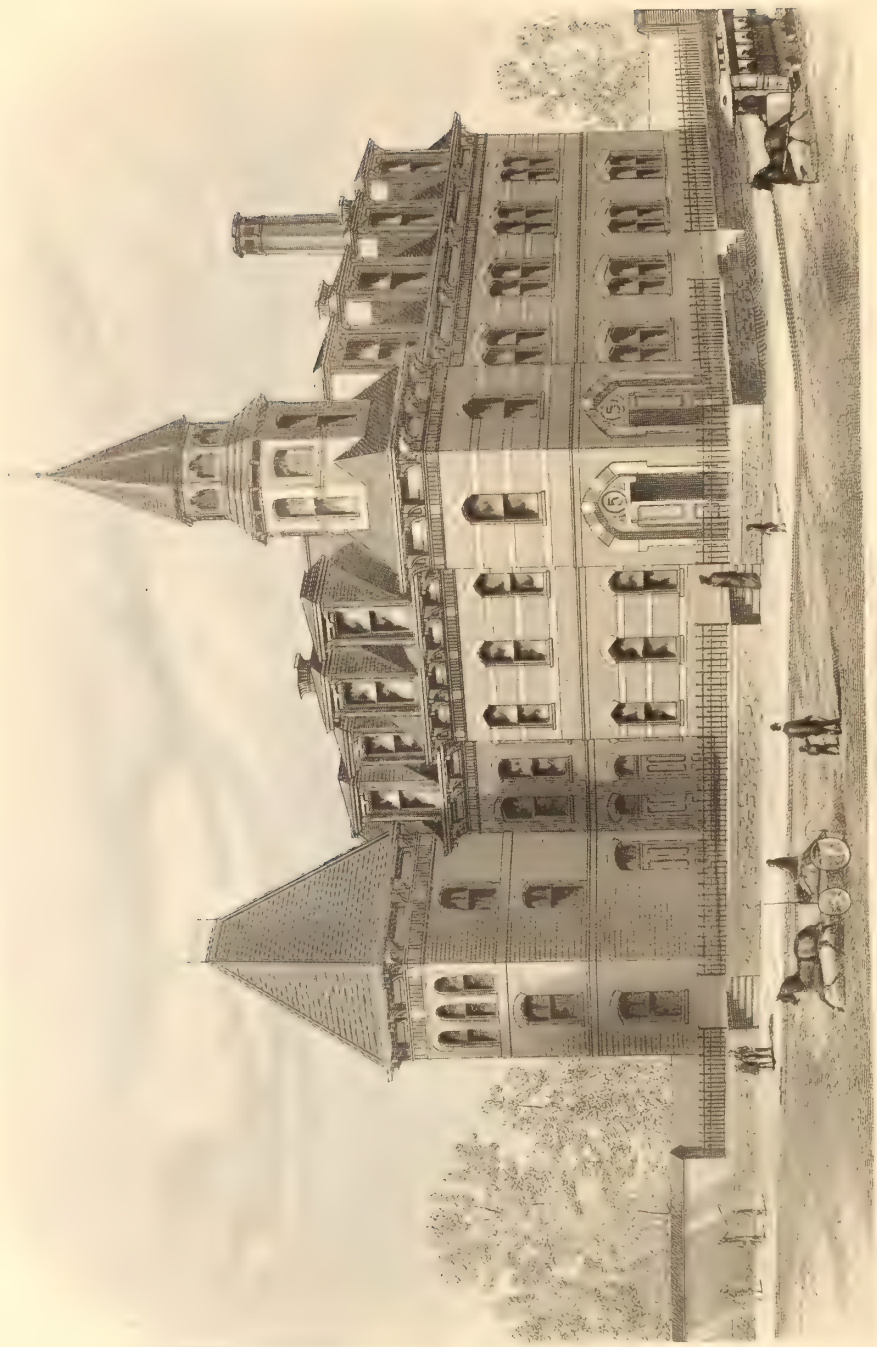
But this meagre system could not long supply the demand for popular education, and in the third year after the city's incorporation, to wit: in 1851, Col. Andrew Derrom, William Gledhill, John J. Brown, Benjamin Buckley and other public-spirited citizens secured the passage of a supplement to the Act of incorporation, establishing a "Board of Education of the City of Paterson," consisting of three School Commissioners from each ward of the city (this number has since been reduced to two). Under this law Col. Derrom was appointed first President of the Board, as well as City Superintendent. He and his fellow workers, among whom may be mentioned the present venerable City Comptroller, William Swinburne, at once bent themselves to the task of modeling a complete and well organized free school system, of which all, rich and poor, might avail themselves. Putting themselves in communication with Horace Greeley, of the *New York Tribune*, then, as always in his busy life, an active patron of educational interests, and other prominent instructors, they visited the schools of New York city, carefully noted them in all their details and then set about the work before them. At once the public schools of Paterson became both popular and useful. The best people sent their children, and upon the plain, time-worn records of those years may be found scores of familiar names of those who are now numbered among the most honorable and useful citizens. It was under such happy auspices as these that the free school system of Paterson was inaugurated. Within the first three years the new Board expended about \$50,000 in the erection of school buildings and for various other purposes. The structure on Van Houten street, near Washington, now School No. 1, was first built, in 1856; next followed, in 1857, the building on Main street, near Slater, now known as School No. 3. An eloquent address, delivered by the late Daniel Barkalow, at the dedication of this edifice, on June 15, 1857, was printed by order of the Board, and is still preserved. School No. 4, on Temple street, was the next school building erected, to supply the growing wants of that portion of the city lying on the North side of the Passaic river.

In the latter part of the decade beginning with the year 1860 the rapid growth of the city demanded still further school accommodations. In 1867 School No. 5 (Totowa) and in 1868 School No. 8 (Newark road) were erected. These were followed by School No. 6 in 1870, No. 2 in 1871, No. 7 in 1873, No. 9 in 1874 and No. 10 in 1875. No. 11 is now being built, in the Fifth Ward, and No. 12, in the First Ward, will speedily follow, temporary schools being established in both districts already at the close of 1881. No. 5, formerly of frame, has been replaced by an imposing brick structure, finished in 1879.

The growth of the system of schools in Paterson has been commensurate with

that of the city itself. The population of the city has doubled within the last fifteen years, and strenuous efforts have been necessary on the part of those to whom the management of the educational interest has been entrusted. Although the growth of the city has rapidly advanced, the demands have been promptly met, and the school system has steadily developed into greater proportions. The schools are classified as follows : Normal, Normal Training, High, Grammar and Primary. The Normal Training Class and the High School meet in School No. 6, corner of Ellison and Summer streets ; there are Grammar Departments in Schools Nos. 1, 2, 3, 4, 5, 6, 10 and 11, and Primary Departments in each of the twelve schools. The object of the Normal School, which is presided over by the excellent Superintendent of Public Instruction, E. V. De Graff, is to instruct teachers in the different methods and principles of teaching ; to familiarize them with the course of study, to increase their knowledge in the theory and practice of teaching ; in brief, *to teach teachers how to teach*. In the Normal Training Class, which is composed of pupils who have completed the High School course, the studies pursued are mental and moral philosophy, and the science of teaching, together with practical work in teaching, under the criticism of the members and the Principal of the High School. The studies pursued in the Primary classes are reading, arithmetic, language, penmanship, spelling and oral instruction in geography, drawing and the elementary natural sciences. The studies pursued in the Grammar Departments, in addition to those of the Primary, are history, grammar, geography and drawing ; to these are added in the High School algebra, geometry, English literature, physiology, rhetoric, physical geography, civil government, philosophy, chemistry, astronomy and bookkeeping.

At the present date (early in 1882) the number of teachers in the employment of the Board is 122, 12 principals and 110 teachers, the salaries averaging in the aggregate about \$7,000 per month. The total payments on teachers' pay-rolls for the fiscal year 1880-1 (10 months) were, for the day schools, \$72,977.98 ; for the evening schools, \$2,586.86 ; total expenditures of Board of Education, including cost of day schools, evening schools and Normal School, \$81,909.68. The highest salary paid is to the Principal of the High School, \$1,800 ; the lowest, in the Primary Departments, \$375. In 1867 the number of children between 5 and 18 years of age in Paterson was 7,093 ; in 1868, 7,903 ; in 1869, 7,661 ; in 1870, 9,225 ; in 1871, 10,029 ; in 1872, 10,625 ; in 1873, 11,704 ; in 1874, 11,949 ; in 1875, 14,028 ; in 1877, 12,193 ; in 1880, 13,672 ; in 1881, 14,712.



PRESIDENTS AND SECRETARIES OF EDUCATIONAL BOARDS AND
CITY SCHOOL SUPERINTENDENTS.

YEARS.	PRESIDENTS.	SECRETARIES.	SUPERINTENDENTS.
1854	Andrew Derrom,*		Andrew Derrom,
1855	Andrew Derrom,		Andrew Derrom,
1856	Andrew Derrom,	Lewis R. Stelle,	Andrew Derrom,
1857	Andrew Derrom,	James Stiles,	Andrew Derrom,
1858	Cornelius S. Van Wagoner,	Victor Aldridge,	Cornelius S. Van Wagoner,
1859	Cornelius S. Van Wagoner.	Charles E. Van Buren,†	Cornelius S. Van Wagoner,
1860	Cornelius S. Van Wagoner,	Horace O. Hedge,	Cornelius S. Van Wagoner,
1861	William Swinburne,	Hamilton Arnot,	William Swinburne,
1862	Josiah P. Huntoon,	Ezra S. McClellan,	Ezra S. McClellan,
1863	John C. Westervelt,	Samuel C. Hosford,	Samuel C. Hosford,
1864	John Cooke,	William Swinburne,	William Swinburne,
1865	John Cooke,	William Swinburne,	William Swinburne,
1866	William S. Hudson,	William Swinburne,	William Swinburne,
1867	Henry L. Butler,	William Swinburne,	William Swinburne,
1868	Henry L. Butler,	William Swinburne,	William Swinburne,
1869	Henry L. Butler,	William Swinburne,	William Swinburne,
1870	Henry L. Butler,	William Swinburne,	William Swinburne,
1871	George B. Day,	P. A. Youngblood,	William Swinburne,
1872	George B. Day,	Vernon Royle,	Samuel C. Hosford,
1873	Isaac Van Houten,	Vernon Royle,	John Laird,
1874	Isaac Van Houten,	Vernon Royle,	William J. Rogers,
1875	George L. Catlin,	Vernon Royle,	William J. Rogers,
1876	Alexander T. Groser,	Vernon Royle,	William J. Rogers,
1877	William L. Bamber,	Vernon Royle,	William J. Rogers,
1878	William L. Bamber,	Vernon Royle,	William J. Rogers,
1879	William L. Bamber,	Edward A. Meller,	William J. Rogers,
1880	Watts Cooke,	Edward A. Meller,	Esmond V. DeGraff,
1881	John I. Holt,	Edward Royle,	Esmond V. DeGraff,
1882	John R. Curran.	Edward Royle.	Esmond V. DeGraff.

* The reports of the Board of Education for the years 1854-4, which were lost, but have recently been discovered, show that Colonel Andrew Derrom was President and Superintendent during those years, as well as in 1856-57. His report for the year ending October 31st, 1854, shows that the salaries paid to teachers at this time were about \$500 for the highest, and some of the teachers did not receive more than \$50 per year.

† Resigned in November, and John C. Westervelt elected.

CHAPTER XLV.

THE GREAT FALLS OF THE PASSAIC.

UP to about the year 1680 there were no white settlers within hearing of the Great Falls of the Passaic, and even the native sons of the soil were few in its neighborhood. The primeval forest clothed the hills about, and the meads and vales afforded pasture for the bounding deer, which as yet knew not the rifle's sharp report. The river and its several tributaries flowed seaward, utterly free and unhindered, dancing over their shingly beds, tumbling over rocks, dashing down precipices or pausing at deep pools wherein the shining denizens of the water loved to linger. No thought of curbing and utilizing these streams had ever occurred to the indolent Indian, as he lazily floated in his canoe or angled in the populous waters. All was free and unconfined, as it had existed from time immemorial. "A Careful Description of the Mural Wonders About Paterson and its Vicinity," etc., was published at the *Guardian* office by Vanderhoven, Irish & Co., in 1859; from this we quote:

The Indian name for the Falls of the Passaic was *Totowa*, which in their aboriginal language signified "*to sink, or to be forced down beneath the water by weight*;" and long after the red man had left the place the name of Totowa Falls designated the spot. The country about the Falls was also called Totowa, and the region on the North side, from the river to the second greenstone range of mountains beyond, still retains the name.

The Indians who inhabited this part of the country were a tribe of Delawares, called *Sawhicans*, whom De Laet characterized as "a very decent people, but always at war with those *Manhatae*" who lived upon what is now New York and the surrounding shores. Honest, simple and harmless, unless aggrieved, they were noble specimens of the American race, and rarely interfered with the conscientious and peaceable Hollanders who came to settle in their midst. The Passaic, or "*Pasha-wick*," signified a *river with a valley*, in comparison to the "*Hackensack*," which expressed a *river in the marsh*. It is a pity the traditions of the Indians in this part of the country were not preserved; but the Dutch were too "matter of fact" to consider their history or their fate of the least importance. The whole province in 1648 contained but about two thousand, who were under twenty kings, twelve hun-

dred of these being under the two Raritan kings, and the remainder divided into eighteen tribes of wanderers, with their petty sovereigns. It will be seen from this that the Indians were not so numerous at that time as is generally supposed. Even in 1618, thirty years before, a letter to England said that this whole region of East Jersey abounded with wild beasts, such as elk, deer, bears and other creatures; and in traveling a whole day's journey one would meet with but few wandering Indians, and these well dressed in deer skins.

But, few or many, the aborigines have left us no record of the extraordinary phenomena at the Totowa (Passaic) Falls. Some writers have attributed the immense chasms and enormous fissures to the action of the water, which, often swollen to great extent, comes down at the breaking up of the ice with terrific force. A survey of the vicinity at once refutes this theory. The great rents in different directions on either side of the basin show that nothing less than the force of an awful earthquake could have slit that solid masonry of the hardest rock. Geologic knowledge also has proved to the man of science that hereabouts the earth has been disturbed, until its whole crust has been upheaved. The mountain which bounds the South side of the basin, as one stands by the Cottage brink, shows each successive layer where the quarrying has removed the debris and the trap, the new and the old red sandstone.

The rock of the Falls itself is properly greenstone, a species of trap which is naturally precipitous. Further up the river, on the road to Little Falls, there are basaltic columns as though carved piece after piece and set in successive pillars, resembling in their order the Giants' Causeway on the coast of Ireland; and below the Falls, opposite Temperance Island, may be seen several specimens of these igneous rocks of an immense size, with their five sides in wonderful regularity, just as they have tumbled down the mountain.

The Great Falls of the Passaic* have long been conceded as unmatched for their picturesque surroundings, even as they are undoubtedly unique in their configuration, having but one parallel, if any, so far as known, on the globe, and that is the great fall of the Mosi-oa-tunja, or "Sounding Smoke," sometimes called the Victoria Falls, on the Zambesi river in Africa, which, although vastly exceeding the Passaic cataract in height and volume, is described as being so exactly its counterpart in all its essential features that a bird's-eye view of one, with dimensions not given, might readily be mistaken for the other.

The main peculiarity of both consists in the leaping of the river into a chasm of rock, and, to an observer from up stream, seeming to disappear. Below the river bed forms an acute angle with that above, passing between tremendous walls of rock, sheer and smooth from summit to base, in a narrow clean-cut rift, through which the pent-up boiling torrent is shot with tremendous velocity clear out into an elbow of the rock, cut as squarely as if by the mason's nicest art, and thence sharply turned back on itself, churned and curdled into masses of cottony flakes, which, first slowly circling about, as if resting after the fierce ordeal, dart away to make the rapid descent over a rocky bed to the more peaceful and evenly-flowing stream below. The best description that can be given of the course of the river at the immediate fall is to say that it very much resembles the letter Z, the top arm represent-

* See Frontispiece.

ing the stream above, the inclined down stroke the chasm into which it plunges, and the lower arm the course the current takes after passing out of the angle referred to above. Although the Great Falls vary much in grandeur, they are always of exceeding interest; when the stream is low, as in mid-Summer, a few silvery threads only flutter over the rock, but the tremendous chasms, most grim and awe-inspiring when the water is low, are always, and must be, a feature that the lover of the picturesque will study with admiration and wonder.

The Falls grounds proper, including all to the North of the river—that is to say beyond the chasm where the bridge crosses—and as far Northward as the first reservoir or thereabouts, including also the valley, but not including the space from the chasm Southward to the entrance gates, were purchased for \$7,500 from Peter Archdeacon, who many years before had bought the Falls property of T. B. Crane, well known to the older citizens as a man of much energy and no little ability, who held a lease of the farm lying over to the Northward and Westward of the Falls, and kept a hotel somewhere in the Totowa region.

The Cottage-on-the-Cliff was maintained by the Archdeacon family for nearly or quite twenty years, but when Mr. Ryle bought the property the Falls grounds were closed for a time, the first intention of Mr. Ryle being to lay out the entire space about the rocks, together with the heights beyond, as a magnificent park about the princely family residence projected and already begun to the Northward. Here the pioneer silk manufacturer hoped to found an elegant home. The work was actually begun, the excavations for the cellars and foundations being still a noticeable feature near the present Totowa reservoir, but the panic of '57 overtook this enterprising man, in common with many others, and the work was abandoned, never to be again undertaken.

The people were greatly angered over the loss of their pleasure ground and holiday rendezvous, and threatened all manner of things if the place were not thrown open as before. They even proposed throwing the owner over the Falls if he dared to keep the gates closed against their free ingress and egress. Against this popular tumult there was no adequate defence, and the grounds were again opened to the public and the premises leased from time to time to various individuals, including Messrs. Labiaux, a Frenchman, ex-Sheriff A. A. Van Voorhies, and others. Later Mr. Ryle conceived the idea of making here a charming public park; a place where the working people might come and enjoy themselves. The Falls grounds about the Cottage-on-the-Cliff were laid out and beautified with flowers, plants, statuary, etc., objects which not many of the later generation have seen. He expended large sums of money on the property for several years, in erecting bridges, in laying out walks and drives and in various adornments. But the vandals whose comfort and pleasure he had in view were not deserving of the kindness intended; they pulled up the flowers, overturned the vases and urns, chipped pieces from the statuary, cut branches from the trees and behaved in a fashion that soon showed their utter disregard of the æsthetic by denuding and polluting the very place intended for their elevation and refinement. The very significant inscription placed over the main entrance, and which still remains there, identical with that over the gateway of the entrance to the Cremorne Garden, London, had no deterring effect.

People could not, or would not, understand that "A pleasure provided for all should be protected by all," and the result was as indicated.

The other large tracts which were afterwards purchased by Mr. Ryle in the neighborhood of the Falls were bought from various individual holders, most of that section being, up to 1850, farming land and covered over with crops. All this afterward—about 1857—became the property of the Passaic Water Company, in whose hands it largely remains to this day.

Among the chief attractions of the Great Falls are the beautiful rainbows which, formed in the spray, frequently hang over the cataract. The Valley of the Rocks is a wild glen overlooked by the Cottage-on-the-Cliff, an excellent hostelry, with ample accommodation, kept by Jacob Haeberle, who has a long lease of the entire premises from the Water Company. The Cottage is perched on the precipitous cliff almost overhanging the ravine, affording a magnificent view of the Valley, the river and the city lying far below. This valley is said to have been a favorite spot of the red men, and many Indian relics were found here, such as stone axes, chisels, corn-pounders, arrow-tips, etc. Both Washington and Lafayette used to love to wander in this glen, and their names, together with many others, were carved by their own hands on the smooth sides of the rock in what is known as the "Grotto of Records," where they may still be seen; the date accompanying the names of Washington and Lafayette is 1778. The Valley is easily reached by a stairway from the Cottage, or from Water street below. The Revolutionary camp ground was near the Falls on the slope of the Totowa hills, near the farm then of Captain Horne, on the premises afterward owned by Messrs. Petry, Bensen, Ryerson and others. Many relics of this occupancy were found in after years, including a bomb-shell, which Samuel A. Van Saun gave to Peter Archdeacon; also a curious old musket and a broken bayonet.

Many accidents have occurred at the Great Falls in past years, a number of which proved fatal. June 22nd, 1812, Mrs. Sarah Cumming, wife of Rev. Hooper Cumming, of Newark, a young, beautiful and accomplished lady, but two months married, visited the Falls in company with her husband, and in the most unaccountable manner fell from the cliff overhanging the basin into the frightful gulf nearly one hundred feet below. Mr. Cumming was with difficulty prevented from leaping over after her, and yet the old Dutch people held stoutly to the belief that he (her young husband) had pushed the unfortunate lady off the rock. So current was this belief that doggerel verses were composed on the affair and sung on the streets. It is held to this day that a tree which overhung the chasm at the spot showed evidences of a struggle and withered from that hour; also, that when Mr. Cumming was preaching in the old Totowa church the Sunday previous (for which purpose he came into the neighborhood) a strange bird of raven blackness entered by a window, flew thrice about the church and alighted on the high pulpit over the minister's head, whence, after making an ominous noise, it flew away out of the same window.

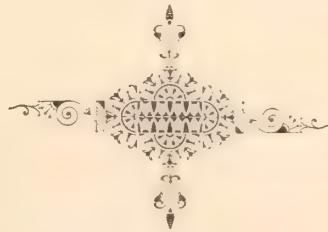
Among others who subsequently lost their lives here were William Whitaker, who fell from a pole at the Southern end of the Chasm bridge; Miss Lamar, who fell into the raceway at the pitch in the rear of the Gun Mill, where, also, a little

girl, aged seven years, was drowned soon after; Joseph Linkletter, whose body got jammed between two sunken rocks in the basin; Mr. Gallagher, an aged man, drowned near the same place; "Mother Emmons," who had the reputation of being a witch, who was drowned in the basin, having fallen from the rocks near the "big trunk" conveying the water to the raceways; George Ray, who was drowned June 8th, 1849, being upset from a skiff in the basin; Owen Cooley and James McDonough, two children, who were carried over the Falls in a skiff and drowned March 10th, 1850; also a number of others who met a similar fate at subsequent dates. One of the most fearful catastrophes that ever occurred at the Falls happened on Sunday, August 15th, 1875. Three foolhardy men, one, James Grogan, married, the other two, William Horton and Henry Martin, single, started in a boat above the Falls, and, though warned repeatedly, the river being swollen, approached too near and were drawn to the edge and dashed over into the frightful abyss. All three were drowned. The body of the first-named was discovered the next day, and parties were abroad about the Falls and on the river banks below during the entire night prosecuting the search for the others. Grogan was found suspended over the chasm, his clothes and shoes having been torn from his body by the action of the water. The body was recovered by using grappling irons, and not without much peril, George Garrabrant, a noted "water-dog," being the foremost in the rescue. The popular sympathy was very great. The funeral was under the direction of the Weavers' Association and the Albion Cricket Club, of which Grogan was a member. On Tuesday Peter Hopper, Charles Van Blarcom and John J. Hopper, while fishing in the river near Hawthorne, saw the body of Henry Martin floating by and recovered it, and the same day a little girl in playing about the Falls espied the body of Horton wedged in between two trees at the water's edge, about fifty feet from the wheelhouse of the Water Company. Horton and Martin were buried together from the house of Mrs. Cole, in West street, where they had been boarders. It is doing but simple justice to a brave man to place on record here the fact that the George Garrabrant above referred to has probably saved more persons from drowning and recovered more bodies of unfortunates from the Passaic river than any other man in Paterson.

During the great flood, December 10th, 11th and 12th, 1878, a strange and thrilling scene occurred just above the Falls. The river was a wild and whirling torrent, swollen to a height but little less than that in the great flood of 1854, the greatest ever known in the Passaic. Walter Lee, a small lad, a son of Richard Lee, of Singac, accompanied by a man named Jacob Hutchings, essayed to drive a team attached to a lumber wagon through the flood which submerged the Little Falls road beyond Spruce street, where the road runs very close to the river's edge. Suddenly the wagon-box was lifted from the bolsters and swept into the current and down the river with incredible velocity. Hundreds of people were about the Falls and on the bridges to witness the grandeur of the cataract, and those on and near the Falls bridge saw the wagon box coming swiftly down with its living freight. The man and boy cried out for help, but no rescue seemed possible; they were nearing the bridge; just below was the Society's dam, and a little farther the frightful plunge over the cliff into the seething abyss, from which arose a deafening roar tha

could be heard over the entire city. Suddenly, as if by inspiration, James W. McKee, a resident of Paterson, and famous as a vocalist—especially in his great song of “Over the Hills to the Poor-house,” which was written for him—conceived a plan of rescue. He rushed to the horse of Dr. P. A. Harris, who, with many others, had driven to the spot, tore the reins from their fastenings, ran back to the centre of the bridge, looped his improvised “life line” and called out to the man and the boy to grasp it in passing; that was their only chance. In view of the great velocity with which they were moving their rescue was truly a marvel. Fortunately, the river being so high, the distance to the water’s surface was much less than usual. Both caught the frail strap on which hung two lives for a few seconds, the spectators looking on breathless with suspense, though some turned away their eyes, unable to bear the sight, and then a great shout rent the air; both had been safely landed on the bridge. Many other casualties might be recorded, the place having been fruitful in catastrophes, fatal and otherwise; but a brief reference to a few more must suffice. The body of Archie Brown was found in 1880, after his having been lost sight of for five weeks, on a shelf of rock a little North of the Cottage, and foul play was suspected but never proven. About the same time two young men jumped from the Chasm bridge, one Sunday, in a spirit of bravado, one swimming out of the basin below, unhurt; the other, named Doolan, being drowned. His body was recovered, after an all-night search, by George Garrabrant. At the coal-drivers’ picnic on the Falls grounds in 1881 a man lay down on the grass near the edge of the cliff not far from the Cottage, fell asleep and, rolling over, was precipitated to the valley below, at least a hundred feet, most of the distance a sheer descent. Strange to say, though the man seemed no more than an unrecognizable mass of bruised flesh, he recovered. James Ryan, a brother of Alderman William Ryan, was drowned in the river just above the Falls bridge in April, 1882.

Other daring feats on the tight rope, besides that of Sam Patch, with which all are familiar, have been performed at the Falls, among them some very remarkable exhibitions of rope-walking. Chief among these was the walk of Mons. de Lave, July 4th, 1860, when he walked a rope stretched over the frightful ravine from in front of the Cottage to Morris Mountain. August 5th, 1879, Harry Leslie performed a similar feat, and, later, George Dobbs performed on a rope stretched across the Chasm.



CHAPTER XLVI.

PATERSON IN THE CIVIL WAR.

THE attack upon Fort Sumpter, which ushered in the war of the Rebellion, occurred April 12th, 1861, and the news quickened all the loyal and patriotic impulses of the citizens of Paterson and stirred them to immediate effort. They pronounced, and with no uncertain utterance, for the preservation of the Union and set about the business of its defence among the earliest of all who rallied for the flag.

April 18th, six days after the first overt act of rebellion, Captain Coventry began recruiting at the office of Justice B. D. Doremus, on Broadway, and twenty names were at once enrolled. Next day, April 19th, the *Daily Guardian* announced that the ranks of the First Union Volunteers of Paterson, Captain Coventry, of the Mexican war, commanding, were fast filling up. A requisition for arms had been made to the State authorities. On Sunday, April 20th, Rev. Mr. Bulkley preached a powerful war sermon in the Congregational Church, which was attended by the City Blues and the Continentals with full ranks. The sermon was printed in full in the *Daily Guardian*, date of April 22nd, on which day the following call was published:

TO ARMS!

The undersigned invite their fellow citizens of the City of Paterson and vicinity, without regard to past political opinions or associations, to meet to-morrow, Tuesday, afternoon, at 2 o'clock, in front of the City Hall, to express their sentiments on the present crisis in our National affairs, and their determination to uphold the Government of their country, and maintain the authority of the Constitution and its laws.

DANIEL BARKALOW,
PHILIP RAFFERTY,
HENRY M. LOW,
A. J. SANDFORD,
D. G. SCOTT,
GEORGE GRIFFITH,
JOHN J. BROWN,
JOEL M. JOHNSON,
JOSEPH N. TAYLOR,
SAMUEL SMITH,
J. A. CANFIELD,

E. T. PRALL,
BENJAMIN BUCKLEY,
A. A. HOPPER,
T. D. HOXSEY,
JOHN BRUSH,
AARON S. PENNINGTON,
A. B. WOODRUFF,
JOHN HOPPER,
H. A. WILLIAMS,
GEORGE WILEY,
and one hundred others.

Next day, April 23rd, the war meeting convened in front of the City Hall, pursuant to notice. Men of all parties participated. The Paterson Brass Band fur-

nished inspiring music. Rev. Mr. Arnold offered prayer. Mayor Prall was chosen President. Rev. William H. Hornblower, pastor of the First Presbyterian Church, made a patriotic speech, and Messrs. Benjamin Buckley, Charles Inglis, Jr., Daniel Barkalow, D. G. Scott, H. A. Williams, T. D. Hoxsey, Rev. Mr. Graves and A. B. Woodruff followed in stirring appeals. At this meeting a committee of twenty-five were appointed to collect means to arm and equip 400 recruits for service within ten days. Patriotic resolutions were passed and published in full in the city newspapers the following day.

April 23rd Captain Coventry had 110 men on his roll and was drilling them on Temperance Island. April 24th the Mayor and Board of Aldermen adopted a resolution appropriating \$10,000 to the support and relief of the wives and families of such men as might volunteer to maintain the Union and support their country's flag.

May 7th at noon three companies, under command of Captains Johnson, Ayres and Coventry, were fully mustered in, preparatory to their leaving town for the barracks of the Excelsior Brigade in New York city. At 2:45 o'clock the line was formed in front of Continental Hall; a throng of thousands lined the streets all the way to the railway depot. The Fire Department turned out in full force and were stationed at different points on the route, and the enthusiasm was unbounded as the gallant volunteers took their departure. The "Old Godwin Guard" acted as escort to the new recruits.

On May 29th the City Blues embarked for the Capital. All places of business were closed. The fire companies turned out and acted as an escort. The crowd on the street was so dense that it was difficult for the Blues to reach the depot. At 10 o'clock A. M. the "All aboard" from the conductor announced that the time had come for the last good-bye. Every bell in the city rang out, and amid the cheers of thousands the train moved slowly off.

Surgeon Weller, of Paterson, attached to the Ninth N. J. Regiment, was drowned off Hatteras January 15th, 1862, and his remains were brought to Trenton and placed in the State House February 11th. On Wednesday, the 12th, the remains reached Paterson, and the funeral occurred on Thursday, the services, at St. Paul's Church, being attended by all the Masonic lodges, the Legislative Committee, the County Medical Society, the Board of Aldermen and by almost the entire community. The bells were tolled during the funeral services, by order of the Board of Aldermen, and flags were displayed at half-mast.

Five thousand men assembled in council July 31st, 1862, in front of the City Council rooms, on Main street, for the purpose of adopting the best means of filling up the quota of Passaic County ordered by the Governor under the proclamation of the President just issued. Speeches were made by Mayor H. A. Williams, Rev. John H. Robinson, Daniel Barkalow, Rev. Dr. Hornblower, Senator Buckley, Thomas D. Hoxsey and Colonel Carman, of the Thirteenth N. J. Regiment.

August 2nd Hugh Crowell Irish, who had been editor as well as one of the proprietors of the *Daily Guardian*, advertised the sale of his grocery business, as he had determined to enlist for the war. The advertisement closed with this postscript "Now, to those young men who have said, 'Why don't you go?' I say, 'Come along; I am in for the war.'" Mr. Irish was City Assessor and Clerk of the Board of Freeholders when he enlisted.

August 12th the first detachment of Captain Irish's company, thirty-six strong, left Paterson to join the Thirteenth N. J. Regiment. This detachment was the result of five days' recruiting. August 13th Captain Irish and Lieutenant J. S. Scott were publicly presented with swords by City Comptroller H. O. Hedge.

A tremendous war demonstration was held on the evening of August 22nd, 1862, at Continental Hall. Addresses were made by General D. E. Sickles, Captain McMahon, Chaplain Bulkley and Lieutenant Scott, of Captain Irish's company. August 26th a meeting of the municipal War Committee was held, and it was resolved that three full companies be raised and equipped at once. It was further resolved that business be suspended each day at 4.30 P.M., that daily mass meetings be held, and that flags be flung to the breeze and the bells be rung to call the people together at the meetings; also that recruiting stations be erected in the streets. This programme was carried out, and the recruiting was rapid. September 1st Captains James Inglis, Jr's., John McKiernan's and Archibald Graham's companies departed for the scene of the conflict. It is a noteworthy fact that during the effort made to recruit for these companies the response from Washington Steam Fire Engine Company, No. 3 (and from other fire companies also), was prompt and emphatic. Captain John McKiernan was an officer of the company and a prominent fireman, and the members took the matter in hand and furnished funds for recruiting and filled up the ranks, largely from the engine company, to a number far beyond the quota required. Jackson Steam Engine Company, No. 4, was also well represented in Captain McKiernan's company, while Captain Graham's company was composed largely of members of Neptune Fire Engine Company, No. 2. The recruiting for these two companies was commenced on Thursday, and on the Monday following they were on their way toward the front with full ranks. The recruiting was carried on in three of Colonel Derrom's sectional frame houses, Captain Graham's quarters being at the corner of Market and Main streets, Captain McKiernan's at the corner of Ellison and Main streets, and Captain Inglis' at the corner of Broadway and Main street. Thus the good work for the preservation of the Union went on as the protracted struggle was maintained on both sides. No diminution in the loyalty or energy of the people was witnessed. The city furnished in all 2,011 men to aid in trampling under foot the rebellion, a considerable surplus over the quota demanded. It is scarcely within the scope of this chapter to follow the brave volunteers in their various battles on land and sea. Suffice it to say that they bravely acquitted themselves wherever they were called, many of them cheerfully turning their backs on fine prospects and more than comfortable homes, and all giving up the endearments of family ties and putting aside fond associations at the behest of patriotism and duty. The roll of the honored dead, elsewhere published in this chapter, shows in part only the sacrifice of human life made by Paterson in the struggle for National existence.

Of the heroes who fell on the battle field two at least deserve more than a mere general notice. One of these was Captain Hugh C. Irish; the other was Chaplain F. E. Butler, after whom one of the Paterson Posts of the Grand Army of the Republic is named. Captain Irish's company was mustered in as Company K of the Thirteenth New Jersey Regiment August 25th, 1862. September 17th, less than a

month afterward, he was killed in the harness while gallantly leading his men at Antietam. The regiment was ambuscaded on the outskirts of South Mountain, and the men suddenly found themselves under a murderous fire of musketry. Every tree, bush and rock sheltered an enemy, and volley after volley was poured into the ranks with deadly effect. It was too much for the raw recruits, unused to scenes of carnage, and they wavered irresolutely, uncertain where to attack or how to meet the foe; then they broke and retreated. Captain Irish sought in vain to restrain their flight and, while crossing a fence, still waving his sword and shouting "Rally! boys, rally!" he was shot through the chest and fell, crying "I'm killed!" He died instantly, and his body was captured by the enemy. Orderly Sergeant Heber Wells gallantly seized the dying hero's sword and saved it from the enemy. Captain Irish's body was recovered a few days later and buried near the spot, the following inscription being rudely carved on a stake at the head of his grave and also on a cherry tree near by:

CAPTAIN H. C. IRISH,

Company K, Thirteenth Regiment N. J. Vols.

"The fittest place for man to die
Is where he dies for man."

It is but justice to the gallant Thirteenth to say that subsequently, on that fatal day, they reformed and acquitted themselves like men, and made for themselves an honorable record in many after engagements during the war.

The death of Chaplain Butler occurred May 4th, 1863. The Twenty-fifth New Jersey Volunteers, Col. Andrew Derrom commanding, having gone on a reconnoissance across the Nansemond on the morning of Sunday, May 3rd, suffered quite seriously in their attack on the enemy. Chaplain Butler insisted on accompanying the regiment and was seriously wounded in the groin, from which he shortly after died. The funeral was held in camp May 7th, the services being conducted by the Chaplains of the Nineteenth Wisconsin and of the Mounted Rifles. Chaplain Butler was endeared to every man in the regiment by his unselfish devotion to the cause and his genuine piety. His remains were forwarded to Paterson and were interred with unusual funeral ceremonies.

It is estimated that the total number of men from Paterson who fought in the army and the navy during the War of the Rebellion was 2,011, distributed as follows: First N. J. Cavalry, 50; Second N. J. Cavalry, 50; Third N. J. Cavalry, 40; Second N. J. Infantry, 100; Third and Fifth N. J. Infantry respectively, 30 in each; Seventh N. J. Infantry, 140; Eighth N. J. Infantry, 15; Ninth N. J. Infantry, 60; Tenth N. J. Infantry, 80; Eleventh N. J. Infantry, 101; Thirteenth N. J. Infantry, 200; Twenty-third N. J. Infantry, 10; Twenty-fifth N. J. Infantry, 300; Thirty-third N. J. Infantry, 80; Sickles' Excelsior Brigade, 200; Hawkins' Zouaves, 25; Wilson's Zouaves, 100;

in other infantry commands, estimated, 200; in the U. S. Navy, Engineers, Sharpshooters, etc., estimated, 200. Following is the

ROLL OF THE DEAD.

It shows that of the 2,011 who went forth in defence of the country in its hour of peril 217 lost their lives for the cause :

First N. J. Cavalry.—Company C, Daniel Roche; Company G, Thomas Burleigh.

Second N. J. Cavalry.—Company M, John Webb, George M. Cole, Thomas Finley, John Whitford.

Third N. J. Cavalry.—Company D, Jacob Baker; Company F, John C. Bogert; Company L, William Clark.

Second N. J. Infantry.—Company C, Stephen Chardeveyne, David Cocoroon, William Potts; Company E, Lee Chadeveyne; Company F, Samuel Jackson, Richard Fairclough, Cornelius Campbell; Company I, Cornelius Brower, W. H. Brooks, Sylvanus B. Burnham, Charles Danforth, George W. Davidson, John C. Scott, Isaac Van Gieson, John W. Flavell, William McCloud, John Zabriskie, Joseph Forbend; Company K, Charles Williamson, Frederick Demuth.

Third N. J. Infantry.—Company K, Thomas O'Neil.

Fourth N. J. Infantry.—Company H, Richard Asworth; Company B, Andrew I. Broughton.

Fifth N. J. Infantry.—Company D, John Williams, Henry Hanley, John Cochrane; Company F, Thomas Kennedy; Company G, William Williamson, John H. Freeland.

Sixth N. J. Infantry.—Joseph Adams.

Seventh N. J. Infantry.—Company A, Robert Harvey, Abram Pittenger; Company B, Joseph Thuckery, William I. Evans; Company C, Richard Van Orden, George Siscoe, Samuel Demarest; Company F, John McLaughlin, Robert A. Garrison, Joseph Hall; Company G, James Watson, John Swift, Peter J. Doremus, James Clark, James Conway, John M. Janeway, John Mack, James Cavanagh, Michael Barlow, George A. Berdan; Company H, Joseph Huckery; Company I, Harrison Deworth; Company K, John Farrell; Company S, James Fletcher, Edward Mewhinney, Daniel Ostrander, David H. Ostrander, Thomas Flannigan.

Eighth N. J. Infantry.—Company A, Peter M. Ryerson, John A. Carrigan, Michael Keller; Company D, John Christie; Company G, Edward McKiernan; Company K, Richard R. Mosley, William E. Halstead, Squire Sharp, Isaac Silcox.

Ninth N. J. Infantry.—Company A, Joseph Reigan; Company E, Finton Delaney, Lucas Tierse; Company S, Frederick Weller.

Tenth N. J. Infantry.—Company F, Thomas Woods, William Woods, Robert Dillon, John L. Emerson, Philip J. W. Jebb, Robert Sherwood, William Stephenson, Abram Harvey, William Holt, John Merrish, William Mitchell, Ralph Berthoff.

Eleventh N. J. Infantry.—Company A, George Dougherty.

Thirteenth N. J. Infantry.—Company C, John Deachant, George Meyers, Nathaniel Barnes, James Graham, John Hamer, John N. Serling, Ellsworth Brower, James Parliment; Company G, Henry Saxon, James Dobson; Company H, John H. Doremus; Company I, William J. Bursford; Company K, Cornelius Meharan, Curtis Bowen, William Freeland, Hugh C. Irish, Frederick C. King, Abram Maryoff, Martin N. B. Demarest, Michael Delaney, Llewellyn I. Probert.

Fourteenth N. J. Infantry.—Company E, Jesse Hand.

Fifteenth N. J. Infantry.—Company E, William S. Cuthbert.

Twenty-first N. J. Infantry.—Company H, Joseph W. Van Houten.

Twenty-second N. J. Infantry.—Company D, Jacob Post.

Twenty-fifth N. J. Infantry.—Company H, David Veader, Henry M. D. Hart, Thomas Helius, Gotleib Heske, Andrew Keife, Alexander Watt, John K. Frank; Company C, William Skinner, Charles

Van Orden; Company E, Richard D. Maryerson, Francis Butler, James Snyder; Company H, Anthony G. Post, Emanuel Labaux, John Lee, Richard Mosley; Company K, Jesse B. Morris, John S. Collins, William H. Shippee.

Thirty-third N. J. Infantry.—Company D, Charles Matoria, John Voorhis, Martin Van Buren, Thomas Henderson, Talman Hickerson, James Hughes, Thomas Hallowell, David Hallowell, Thomas Eaves, Walter W. Brown, John Braun, Martin Braun, Thomas Sands, Michael Phalon, Edwin Ryan, Alexander McGill, William Barry; Company E, Anssey Willis, Frederick Ehrnests, Everett Horton; Company I, Charles Amys, Thomas Williams, David Rupell.

Thirty-seventh N. J. Infantry.—Company A, Jacob Woodward; Company B, John E. Woodward.

Thirty-ninth N. J. Infantry.—Company H, James I. Garrabrant; Company K, John Conklin.

Forty-ninth N. J. Infantry.—Company H, William C. Boone.

Ninety-third N. J. Infantry.—Company K, Robert Garmall.

Fifth N. J. Battery.—Company B, Ralph Buckley, Nehemiah J. Polis.

Tenth N. J. Battery.—Company F, Thomas Adams.

Forty-eighth N. Y. Infantry.—Company B, Thomas Vasey; Company C, Peter B. Fenwick, Peter Boone; Company E, Frederick Gilmore; Company F, James A. Williams.

Fifty-fifth N. Y. Infantry.—Company B, John Scallion.

Sixty-sixth N. Y. Infantry.—Company F, Adam Williamson.

Seventieth N. Y. Infantry.—Company A, Burclay Walke, Charles Gunkle, Sidney Goulding, John Slater, Garrett A. Van Dien, Charles Ryerson, George M. Doughlap, John O'Neill, Robert Harvey, Frederick Kane.

Ninety-fifth N. Y. Infantry.—Company A, James D. Pittenger.

One Hundred and Thirty-First N. Y. Infantry.—Company C, John Vreeland.

One Hundred and Thirty-Second N. Y. Infantry.—Company E, Henry J. Heinrichs; Company H, George E. Vercelius.

First Excelsior.—Company A, John Van Houten, Morris Hinchey; Company I, Jonathan Hilton, Henry Kiscock, John Markham, Joseph B. Drew, William Sherwin, Benjamin Sherwood, George M. Garrabrant, Joseph Winters, Peter Monks, William Monks, Lewis Miller, James Clegg, George Buggins, Andrew Campbell, Patrick Rafferty, Michael Ryan, William Ackerman, Edwin Bizley, Alfred I. Blanchard.

Second Excelsior.—Company D, John D. Redner.

First N. Y. Engineers.—Company H, Ebenezer Parker.

Seventy-second Illinois Infantry.—Company B, Robert B. Redman.

Twelfth U. S. Infantry.—Jonathan Oliver.

Second U. S. Cavalry.—Company I, Matthew I. Dougherty.

Fifty-second Pennsylvania Infantry.—Company E, Ebenezer Freeland.

THE SOLDIERS' AND SAILORS' MONUMENT

Association was organized in 1867 for the purpose of erecting a fitting memorial in recognition of the loss of the brave men from Passaic County who fell during the War of the Rebellion. On the 26th of November, 1868, the corner-stone was laid with appropriate ceremonies. There was a procession in which nearly the entire

male population of the city joined, among those in line being the city and county officers, United States and State officials, the Fire Department, all the secret, benevolent and temperance organizations, veterans of all former wars, etc., an immense concourse. Prayer was offered by Rev. John H. Duryea, D. D., the corner-stone was laid by Rev. William H. Hornblower, D. D., and an oration was delivered by General John B. Cochrane. In laying the corner-stone, Rev. Dr. Hornblower said :

“As a humble representative of the people of this city and county I lay this corner-stone in the name of God, under whom we enjoy religious and civil liberty, to perpetuate the memories of our heroes and patriots, and to preserve the names of our fellow-citizens who gave their lives for their country; to transmit to future generations this evidence of our love for our country and its defenders. May God approve of our design and may a grateful people speedily execute it, until the monument shall rise to its full height on this proud eminence, to proclaim far and wide how we love the brave, good and faithful soldiers who have preserved our liberties. And the glory be to God forever. Amen.”

Among the articles placed in the corner-stone were : Rolls of the Army and Navy Veteran Association, the Monument Association, the Common Council and the Board of Freeholders ; deed of site from the Passaic Water Company ; design of monument ; copies of the Paterson *Guardian* of the 13th, 14th, 16th and 25th of November ; description of Paterson, by Colonel Andrew Derrom ; various United States and foreign coins ; badges of the Veteran Associations of the different societies and mourning badge of the late President Lincoln ; copy of seal of Monument Association ; *Ulster County Gazette*, date of 1800 ; copies of the Paterson *Press*, date of November 24th and 25th ; copies of New York dailies ; pictures of Andersonville Prison ; roll of Fire Engine Company No. 1 ; photograph of fire engine No. 3 ; photograph of Passaic Falls ; resolutions of the Forty-first Congress donating cannon for the base of the monument ; record of the Kearney Rifles, of Paterson, and many other articles. The monument, which was completed in October, 1870, is a prominent object which, from its elevation on “Cannon Rock,” can be seen from almost any portion of the city. The design includes a square pediment, built mostly of brown stone, with Italian marble tablets inlaid to receive the names of the heroes whose loss it commemorates. On one side is the State coat-of-arms, with sculptured flags, cannon, etc., and on another that of the county. From the base springs a square tapering shaft, traversed by several bands of Nova Scotia stone, on which appear the names of battles in which Passaic County was represented. Between these bands the corners are chamfered off. The column is finished with a semi-Corinthian capital, and on the top stands the figure of an American soldier in full uniform and equipments, looking South. This is of Italian marble and is eight feet in stature. The monument from the base to the top of the figure is sixty-three feet in height.

Soldier, rest ! Thy warfare o'er,
Dream of fighting fields no more ;
Sleep the sleep that knows no breaking.
Morn of toil, nor night of waking.

END.





